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FARMER'S DIGEST STAFF
Editor and Publisher — Hugh Highsmith
Livestock Editor — Al Haller
Office Manager — V. M. Binkert
Industry Sales Representative — Raymond C. Groendyke
Subscription Service — E. M. Hartwig

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ADVISORY EDITORIAL STAFF
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Department of Soils, U. of. Mo.
Hugh H. Bennett, Ex-Officio, Soil Conservation Society of America
G. B. Gunlogson, Agricultural Engineer
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T. J. Rutherford, Director, Veteran's Land Act, Ottawa, Canada
W. T. Spanton, Chief of United States Ag. Education Service

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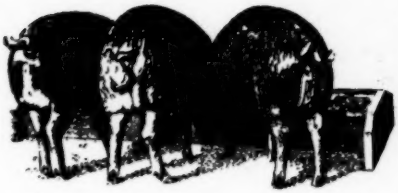
The Farmer's Digest

Volume 21 March 1958 Number 9

Will Hog Prices Go UP Tomorrow?



Should you market hogs on Monday or Friday? What is the best month? Will prices go up again tomorrow if they went up today? Here are answers from a 5-year market study . . .

Condensed from National Live Stock Producer

Patrick J. Luby, Purdue University

DECISIONS to market hogs usually must be made before the market opens and prices paid on the preceding market day are sure to change. Is there any way to reduce the risk of a price decline?

In order to find out more about the daily price fluctuations of hogs, an analysis was made of each of the daily changes in the average price of barrows and gilts sold during 1,263 market days at Indianapolis, Ind.

More than one-third of the hogs marketed by Indiana farmers are shipped to Indianapolis, the third largest hog market in the U. S.

5 Year Average $19

The five-year period of the study (1952-56) covered about one hog cycle. The price of hogs was about $18 at the beginning and end of the five year period. It included wide variations in average price from $28.49 on April 22, 1954, to $10.74 on December 7, 1955. The average price paid during this period was slightly over $19.

On the average, prices rose about 6c from Thursday to Friday and almost another 6c from Friday to Monday. Then prices declined 10c from Monday to

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Tuesday; lost another penny from Tuesday to Wednesday and a half cent from Wednesday to Thursday. Price fluctuations, of course, occurred on each day of the week and the price pattern paid for hogs each week was not uniform.

The number of farm wives working increased from 17 per cent in 1950 to 26 per cent in 1955. For rural nonfarm the increase was from 22 per cent in 1950 to 24 per cent in 1955. Urban figures show even larger increases.

The chance of a price change varies on different days of the week. From 1952 to 1956, hog prices increased most often on Fridays and Mondays and least often on Tuesdays.

During the five-year period hog prices at Indianapolis:

- Increased on Monday 54% of the time.
- Increased on Tuesday 36% of the time.
- Increased on Wednesday 50% of the time.
- Increased on Thursday 51% of the time.
- Increased on Friday 56% of the time.

Large price declines (50c or more) occurred most often on Tuesdays. Large price increases occurred most often on Mondays. About half the daily price fluctuations were less than 25c. About 80% of the daily swings were less than 47c and 90% were less than 59c.

Average daily price fluctuations were greatest on Mondays (34c) followed by Fridays (30c); Tuesdays (28c) and Thursdays (28c). The average daily fluctuation was lowest on Wednesday (25c). The average daily fluctuation for all days of the week was 29 cents.

During the five-year period, hog prices usually declined irregularly from June through November and increased from December through May. The average weekly price pattern does not appear to vary much during the different seasons. However, the Monday and Friday average increase was largest during the spring and least in the fall.

The average Tuesday price decline was least during the late spring when prices were rising and greatest in the late summer and early fall when prices usually were falling.

Daily price rises were most frequent during May and March and least frequent during October.

A price increase was not always followed by a decrease the next day. Nor was a price decline always followed by a price rise the next day. On nearly half

(47%) of the market days at Indianapolis, a change in the price of hogs on a particular day was followed by a change in the same direction on the following day. On less than 53% of the days was a price trend reversed the following day.

Prices sometimes rise or fall each day for over a week. The longest continuous price change during the five years was a decline in the price of hogs for 11 consecutive market days in October, 1952. Sometimes, one extended trend follows another. In September, 1956, for example, hog prices declined each day during the first eight market days of the month. During the next nine market days, the average price of hogs rose each day.

During June, 1953, prices declined nine straight days; during June, 1954, prices increased for seven straight days. The next June (1955) prices dropped for nine consecutive days, but in June, 1956, prices increased again for seven consecutive days.

On days following large price increases of 20c or more, price declines were more frequent than price increases. This pattern did not hold true from Thursday to Friday. More than half the time, the price trend on Thursday was followed by the same kind of price trend on Friday.

Hog Receipts Set Price

When the average price of barrows and gilts is $20, the daily average change in price is less than 25c about half the time. About one-fourth the time, the average price increases more than 25c; and one-fourth the time it declines by more than 25 cents.

Character makes the man, experience makes the character, and mistakes make the experiences.

There is some tendency for price fluctuations to be higher during higher price periods although small and large changes have occurred at both high and low price levels.

Daily changes in hog prices are, of course, unpredictable. Price changes are influenced by many factors. A few of them are: Receipts at the market of your choice (in this case Indianapolis); receipts at other large hog markets; receipts the previous day at all markets throughout the country; demand for hogs at the local market and demand for hogs throughout the country.

Chances of a price increase are greater from December through May and on Mondays and Fridays. Chance of a price increase is also a little better than a price decline on the day after a sizable price drop except on Friday.

Profitable Dairy Management in 1958

Successful management as it relates to housing and quality forage . . .

Guernsey Breeder's Journal

Dr. J. W. Pon
North Carolina State College

THE human element — the "cowman" — is by far the most important single factor in determining the success or failure, the excellence or mediocrity of a dairy farm enterprise. The focus on sound and alert management is constantly becoming sharper. The manager is the controlling factor — the pulse of all aspects of the complex operation. To be successful he must give proper attention to all aspects.

Being human and an individual, his emphasis will vary, and this is not critical as long as reasonable balance is maintained. Some managers excel in the use of mechanization and labor-saving devices, others find their greatest achievements in their breeding program, and still others excel in their feeding systems.

The underlying characteristic necessary to the success of all dairy farm managers, however, is the love and understanding of the dairy cow, and an alertness to her needs, her appetite, her comfort, her health, her genetics, her mammary system, and her individuality. With this understanding and alertness, and a personal pride in accepting the 365-day per year challenge of the dairy farmer, successful management will be the inevitable reward.

Capital Investments

We are all conscious of the continually rising capital investment required for dairy farm operations. These larger investment requirements naturally place an increasing premium on sound and effective management. *The greater the investment, the more costly are mistakes of management.* A recent farm management study on the costs of establishing dairy farm operations in Piedmont, N. C., showed that $1,608.00 per milking cow

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is now required even with pole-type housing.

In this study, land costs were $165.00 per acre; building costs, including a pole type lounging barn, milking parlor and trench silo, amounted to $203.00 per cow; milk room equipment averaged $63.00 per cow, and dairy farm machinery requirements were $230.00 per cow. The average investment in cows was $265.00 per animal.

More than 400,000 people in America own one or more hives of bees, making a total of more than 5,000,000 colonies.

In this study, the investment per cow in buildings due to the use of pole-type construction was less than one-half that required per cow in conventional type barn construction. This opportunity for reducing capital investment should not be overlooked when new construction is required.

A number of studies have shown that changing from conventional to loose-housing arrangements will not eliminate mastitis and breeding problems. On the other hand, this housing change aggravates the "boss cow" problem, increases bedding requirements, and does not permit a purebred breeder to display his animals to visitors and prospective buyers as effectively as he can in a conventional stanchion barn. Better herd management is required in doing a top job with a loose-housing, milking parlor arrangement. However, with good management, the loose-housing limitations do not become major problems, and there is an excellent opportunity to save $300.00 per cow on capital investment. With proper planning there can also be substantial savings in labor, and desirable improvements in the convenience of herd feeding, milking, and care.

Dairymen, as well as consumers and friends of the dairy industry, should never overlook the fact that a 30-cow milking herd requires a minimum investment of $48,000, and that additional building and equipment requirements on some markets can easily run this cost to $60,000. This is a much greater investment than is required by lawyers, doctors, and many other professional groups to establish their practices.

Calf Housing

Another opportunity for sound economy in capital investment is in the management and housing of dairy calves. Expensive buildings and equipment are not necessary to grow good dairy calves as long as drafts and dampness are avoided.

In recent research studies at North Carolina State College, calves housed in a pole-type shed open on the south side were apparently healthier than a similar group of 40 calves housed in a conventional calf barn. Body weights and feed consumption in the two groups were comparable; however, four cases of pneumonia developed among the calves in the conventional barn with no cases among the calves in the open shed. Another phase of these calf housing studies, which is particularly adaptable to the southeastern section of the country, revealed that calves raised in low cost, individual portable pens, on open pasture throughout all seasons of the year, grew as fast, and were healthier and more vigorous than a similar group of calves raised in the closed conventional barn.

One important and relatively inexpensive item that is frequently overlooked or neglected in calf housing arrangements is an adequate source of clean fresh water. Just watering the calves occasionally or providing water from a contaminated source, adversely affects both the health and growth of the young stock. A 100-lb. calf will drink 20 per cent as much water as a 1000-lb. mature animal, not just 10 per cent as much.

Quality Forage Production and Feeding

Much has been said and written about feeding high quality roughage in larger quantities so that smaller amounts of purchased concentrates will be needed. This is certainly a worthy objective of any good dairy farm manager and, on the average, we can greatly increase the amount of good forage consumed, reduce the amount of grain fed correspondingly, and maintain good production.

Several new sweet potato products, including sweet potato chips, diced julienne strips, and frozen sweet potato french fries, may appear on the market soon.

In feeding trials at North Carolina State College, 1000-lb. cows fed four lbs. of grain consumed 35 lbs. of hay equivalent daily where they had free access to alfalfa hay and corn or alfalfa silage at all times. Silage consumption was equated to hay equivalent on the basis of three pounds of silage to one pound of hay. This consumption of 3.5 lbs. of hay equivalent per day per hundred pounds of body weight is considerably higher than the 2.5 lbs. per day per hundredweight, which is generally considered a liberal roughage allowance. The production

of cows receiving the limited grain and high level roughage ration was maintained as well as that of cows receiving a limited roughage and high level grain ration. This was true, however, because the roughage used was of high quality.

Rats multiply so fast that one pair could conceivably result in a rat population of 400,000,000 in only three short years.

In these studies, individual cows consumed from 2.6 to 4.8 lbs. of hay per day for each 100 lbs. of body weight. This wide range certainly indicates wide differences among individual cows. Presumably, some of this difference is inherited. The forward thinking manager may well give consideration to major differences in roughage consumption among his cows, along with production and type data, when making decisions on removal of animals from the herd.

The most important single consideration in making quality hay is stage of maturity. Many research trials show that the method of storage of hay or silage has relatively little to do with the quality of the forage from the standpoint of milk production if reasonable care is taken in the process. As forage crops, particularly grasses, mature, they increase in their per cent content of fiber and lignin and decrease in digestibility and content of protein, phosphorous, carotene, and total digestible nutrients.

Alert management is a primary factor in determining whether the milking herd receives high quality, nutritous forage with real milk producing potential or over-mature high fiber, low quality forage that even with liberal grain feeding puts the cow at a disadvantage. A few basic rules management needs to follow in having quality roughage available at all times for the milking herd, are as follows:

1. Provide a grazing cushion.

Some acreage should be seeded to a mixture similar to alfalfa, ladino clover, and orchard grass that can be used equally well for grazing, silage or hay. When the weather is hard on pastures, use this area for grazing, and when pastures are good, harvest the forage as silage or hay.

2. Harvest forage, rain or shine.

We find that with a field chopper, a hay baler, and a platform hay drier, we are able to harvest quality forage at very nearly the optimum stage—just as the crop starts to bloom or head. If the weather is rainy, or threatening when the crop is ready, the chopper goes in the field and quality roughage goes in a silo. If the

weather is good, the crop goes on the ground, the sun is utilized and the baled hay goes in the barn. We find a stem crusher attachment on the mower a real saver in time required for hay curing.

When the weather does not favor rapid drying in the field, the hay is baled as soon as the moisture content is reduced as much as is possible under existing circumstances, and the bales are placed on a wooden platform near the edge of the field, and covered with canvas—a portable blower is used to further reduce the moisture content until the hay can be stored in the barn. If a small quantity of hay is involved, the hay is left on wagons which are pulled together and covered with canvas to permit drying with the blower.

We feel that the abundant supply of quality roughage that has been available to our College herd at all seasons of the year under this system has been an important factor in major increases in the average production of the herd during recent years. The herd average (DHIA) for the testing year ending June 30, 1957, on 88.17 cows, was 11231 lbs. of milk and 480 lbs. of butterfat.

Other Factors

We have discussed successful dairy farm management primarily as it is related to housing systems and a quality forage program. Time and space do not permit considering some of the important management problems in disease and parasite control and prevention, quality milk production, record keeping, and other matters. However, the alert and successful manager will constantly study the effect of new developments in all areas of dairy production and marketing on his operation, and he will adopt those new methods that will help him increase the income provided by his dairy herd and reduce his operational costs.

When Red Calves Were Cheaper Than Black

For many months after their arrival, the early settlers of New England had no beasts of burden; when at last a few cows were brought over from the mother country, they were poorly fed on coarse meadow hay, and often died from exposure and want of suitable food, or fell prey to the wolves and the Indians. A red calf soon came to be cheaper than a black one, on account of the greater probability of its being mistaken for a deer and killed by the wolves. —First Annual Report of the Secretary of the Massachusetts Board of Agriculture, Boston, 1854, *as reprinted in Agricultural History.*

Fifteen Hundred Hogs a Year

Multiple farrowing, all growing pigs on drylot and every tillable acre in corn; that's Hays Bulfer's program . . .

Condensed from The Farmer

Harold M. Johnson

HAYS BULFER of Blue Earth County, Minn., took a good look at his hog raising set-up and decided a profitable future for him in the business meant doing one of two things—either get bigger or get out.

He decided to get bigger. This wasn't a snap decision. A lot of figuring and planning went into his new system for farrowing, fattening and finishing 1,500 hogs a year, 250 head being ready for market every two months.

Under his previous set-up, Mr. Bulfer turned out about 200 hogs a year. Alfalfa pasture was the backbone of the system. Now he's switched to a new "production line" operation that features (1) multiple farrowing—a new crop of about 250 pigs every two months; (2) a life-cycle feeding program that's completely drylot; and (3) putting almost every tillable acre on his 140-acre farm into corn every year.

Seventeen sows that farrowed the first part of July represent the first cycle in Mr. Bulfer's multiple-farrowing program. Another group of 25 sows started farrowing the first week in September — another in November. This system now underway, with groups of about 25 sows being bred to produce a new crop of pigs every two months, is expected to produce the annual crop of 1,500 pigs. That means each sow in a herd of 75 will have to produce two 10-pig litters a year.

On the basis of performance thus far, they will. Furthermore, Mr. Bulfer figures his pigs should hit 200 pounds and be ready for market at close to five months. He estimates total cost of production will average $8.50 to $9.00 per hundredweight.

"As I get all the kinks ironed out and improve on efficiency, I hope to get that cost figure below $8.00 per hundredweight," he said.

The new venture isn't Mr. Bul-

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fer's first major innovation in hog production. He's been in the business 23 years and has continually changed his production set-up to meet changes in consumer preference for pork and to put improved management practices to work on his farm.

The pencil may be the farmer's best friend. Agricultural economists say the farmer who keeps careless records, or no records at all, may be pushed out of the picture in today's high-gear farm business.

Modesty is the mark of this outstanding hog farmer who emphasizes that "even after 23 years in the business, I've still got a lot to learn."

Mr. Bulfer also stresses the fact that he isn't doing the job on the new, stepped-up production system alone. His assistant manager on the actual production line is Ed Meir. Assisting in the record keeping department of the large-scale operation are Mrs. Bulfer and daughter, Donna Jean, 14. A son, Donald, is a senior at nearby Mankato State Teachers College. Although busy preparing for a career in music, the former FFA member still gets home most every week end to do some farming. Here's how the system he and his dad worked out together operates.

Crates, Early Weaning

A few days before farrowing, sows are brought into a hog house that's used for what you might call a maternity ward. As individual sows are about to farrow, they are moved from the maternity ward to crates in the farrowing house next door.

Pigs are weaned at 3 to 3½ weeks of age. That's pretty early. But Mr. Bulfer has done it before and sees no reason why it can't be done in the new system. He has a special technique he believes is largely responsible for the success he's had in getting pigs on their own in less than a month.

"After the first 10 days or so, I keep the sows outside a little over an hour on their routine morning and evening trips out of the farrowing crates for feed and water. Suckling pigs are used to getting milk from their mother about every hour. When the mother doesn't show up the pigs get hungry enough to get interested in the feeders. As soon as one or two start eating, the entire litter usually gets the idea in a hurry."

Mr. Bulfer's only trouble thus far with early weaning—at least it appears to be related to early weaning—has been several minor outbreaks of "gut" edema. He watches the pigs closely. If

trouble develops, it has been checked by switching from the regular starter ration to one of rolled oats loaded with sulfa drugs. The special ration, when needed, is fed five days.

Once pigs are weaned, they go to the second major stop in the production line—a hoghouse for drylot feeding that Mr. Bulfer put the finishing touches on just recently. This building has a center aisle on the inside, a cement floor, and cement platforms along both outer walls.

The area on both sides of the center aisle is divided into three pens by self-feeders. There's a self feeding trough at both ends of every pen.

A 12-inch gutter runs along both sides of the center aisle. Manure is scraped from each pen and into the gutter every morning and evening. This twice a day cleaning, plus a heating unit suspended from the ceiling in one end of the building, keeps pens dry and eliminates the need for bedding in this particular building. Manure that accumulates in the gutters is hauled out every 3 or 4 days. Hogs stay in this new building from weaning to a weight of about 80 to 100 lbs.

The next and final step in the production line is a nearby building where each group of hogs is put for finishing. This building is equipped to take care of the hogs until they hit 200-220 pounds and are ready for market. At this final stop, feed is self-fed from outside feeders located in individual pens on a cement platform.

That's about the story on the three main stops each group of hogs will make in Mr. Bulfer's new system. Now, how does he manage his sows to get an average of 10 pigs per litter twice a year? What's his breeding program? What does he feed and how does he handle feed for a set-up designed to turn out 1500 pigs per year with a minimum of labor?

Prevention of livestock losses in the United States could mean an additional $2,209,000,000 income for stockmen.

Sows not in the maternity ward or nursing pigs, will be housed in two portable sheds. In addition, one-half of the house used for the maternity ward will also be used to provide shelter for sows over the winter. Sows now are gleaning whatever corn the picker didn't get in a 21-acre field near the farmstead. To make sure the sows get plenty of exercise, especially the last few weeks before farrowing, Mr. Bulfer makes them walk 30 rods to outdoor self-feeders.

Early weaning helps keep his sows in top condition. Getting the pigs away from the sow in 3-3½ weeks after farrowing does not give the pigs a chance to run her down. She can be bred back soon after farrowing.

In 1920, the United States had more than 70,000,000 meat animals; by 1957 the number was 95,000,000.

Only the top gilts—the fastest gainers and those from big litters —are selected as replacement stock for the breeding herd. Her first litter makes or breaks a gilt. If she doesn't produce a big litter, isn't a good mother, or has any other undesirable characteristics, out she goes. All sows will be sold and replaced after they have produced their fourth litter of pigs.

There is bound to be culls along the way, especially among the group of first-litter gilts. Mr. Bulfer plans to increase the size of each freshman group to 28 or 29 gilts to account for the three or four drop-outs that will undoubtedly occur. Even if he ends up keeping all 28 or 29 gilts after the first farrowing, additional drop-outs could occur in succeeding litters. Sows doing a satisfactory job in other respects may have to be culled for reasons like teat or foot injuries.

Four blood lines — Duroc, Hampshire, Berkshire and Yorkshire—make up the breeding of his present sow herd. These sows are being serviced by two hybrid boars.

Mr. Bulfer has aimed his breeding program in the direction of more muscling, more length, and faster gains. All hogs are marketed on the grade and yield basis. The record, up to 85% No. 1 hogs, speaks for the kind of a job he is doing in getting meat-type hogs on the market. And these are meat-type hogs that are marketed at about five months. The average of about 10 pigs per litter reflects his success in grading up the herd for this particular factor.

Pigs are started on 24% protein pellets. When they've eaten an average of two pounds each, they then get a 16% protein ration consisting primarily of cracked corn, protein supplement, and antibiotics. This 16% protein level is maintained until the pigs have eaten an average of 10 lbs each. Then they get a 14% ration until they hit 80 to 100 lbs. After that and up to the marketing weight of 200 pounds of so, the protein level is cut to 12%.

Bred gilts get a ration of one-third ground alfalfa hay, one-third oats, and one-third shelled corn up through the first farrowing. After that, they get no more

corn. It is replaced by boosting the oats to two-thirds of the ration. Older sows get even a higher percentage of ground alfalfa. After the third farrowing, the ration is switched to 60% hay and 40% oats.

Each ton of manure will replace about 10 pounds of nitrogen, five pounds of phosphate and 10 pounds of potash.

From May 1 to November 1, the breeding herd grazes on a strip of alfalfa pasture.

"Self-feeding a ration containing 60% alfalfa may seem like a lot of hay considering the fact that they're grazing alfalfa in the summer. But I find this amount of hay mixed in the self-fed grain ration holds down the grain intake. Self-feeding the ration cuts down considerably on chore time and has done a good job of conditioning the sows between farrowings."

About the last three weeks before farrowing, the sows are "flushed" by adding a supplement to bring up the protein level. Antibiotics are also added to the pre-farrowing ration.

Mr. Bulfer didn't leave room for a scoop shovel in the feed handling system he designed several years ago. The granary he uses has an inside elevator with overhead bins. Moving grain into the holding bin, through the grinder, into the feed mixer, and into a self-unloading wagon is all done automatically. His biggest grinding job is carrying baled alfalfa from a flat-bed trailer to the grinder, removing the twine, and getting the bales into the grinder.

Accompanying Mr. Bulfer's new volume set-up for raising hogs is a major change in his cropping program. He plans to put all but 10 of 100 tillable acres into corn every year. The 10 acres will be reserved for a rotated strip of alfalfa pasture.

Has Raised Continuous Corn

Continuous corn isn't new to Mr. Bulfer. The 1957 crop was the sixth in a row he has taken off a 21-acre field. He has never harvested less than 115 bushels per acre since he put the field into continuous corn. Satisfied that it can be done on his soil type, Mr. Bulfer put everything but 10 acres of pasture into corn last spring. He'll do the same this spring.

Mr. Bulfer has made an annual application of a soil insecticide every year on the 21-acre field that has been in continuous corn for six years. He plans to use the same treatment on the remaining corn acreage that will be put into corn for the second straight year this spring. He has also experi-

mented with post-emergence spraying to kill pigeon grass.

"I've never had cleaner corn and plan to put the grass killer on most or probably all of my corn acreage next year," says Mr. Bulfer.

In summarizing his new hog raising operation, Mr. Bulfer says "The gamble looks good on paper. I've increased my hog output from 200 to 1,500 hogs a year with a minimum of additional expense — most of the added costs of expansion went for the new "fattening" house.

"But like most everything else in farming nowadays, there's no assurance that the new system will be a sure thing. A bad break somewhere along the line, for example, could put the entire farrowing cycle out of kilter."

Although this possibility exists, Mr. Bulfer is out to keep loopholes for trouble checked. Both he and his assistant, Mr. Meir, make it a point to glance over every hog twice a day. If any one animal doesn't look right, he is isolated from the herd and put under close and almost constant scrutiny. Maybe it is just an off day and a pig isn't eating. Or, it could be the start of some disease outbreak. If it is the latter, the symptoms are investigated immediately to determine what kind of treatment seems advisable.

Bred Sows and Gilts Need Adequate Protein

When feeding bred sows and gilts, remember to provide enough protein. Not enough protein will cause small, weak pigs at farrowing and will increase death rates.

W. F. Nickelson, Illinois extension livestock specialist reports that researchers have studied how different levels of protein in a gilt's gestation ration affect litter size and strength of the pigs. Two levels of protein were fed in the trial — 10.7 and 14.3 per cent.

Results showed the same number of pigs farrowed on the two levels of protein. Only 77.2 per cent of the pigs from gilts fed low protein levels lived 21 days. On the other hand, 92.2 per cent of pigs from gilts fed higher protein levels lived to 21 days.

This work shows that feeding low protein rations to gilts during gestation causes them to farrow weak pigs that are less resistant to diseases. The result is higher death losses.

Remember that bred gilts are still growing and therefore need more protein than mature bred sows. —*Farm News*

Beef Cattle Performance Testing Is Organized

Some bulls have the inheritance to sire more weight in their progeny at birth, weaning and market. The problem is to sort them out . . .

Condensed from Breeder's Gazette

Samuel R. Guard

SOMETHING new, something vital, something fundamental, something money-making for you is being added to American beef production.

From Oregon to Maryland you get wind of it, and in almost every state in between you can find beef farmers who are making up to 3 lbs. a day at less cost per cwt. of top-quality gain. They are doing this with scales, ear tags, neck chains and a sharp pencil. No extra cost of feed. Just taking advantage of the fact that weight-per-age is almost 50% heritable.

According to *Clyde Reed* of Oklahoma: if you have 30 cows and a 90% calf crop, and figure only 30% heritability, a purebred bull calf that weighs 550 lbs. at weaning instead of the average 450, will, in 4 years, with feeder calves selling at 20c a lb., allow you to pay $325 more for that heavier prospective sire at weaning.

Gainability is Inherited

Montana's *Paul Orcutt,* who certifies Individual Performance Records, says gainability is 60-65% inherited. Indeed, Paul declares the 12-18 months' weight is the most highly heritable characteristic of a young beef critter.

Prof. Orcutt indexes beef bulls for the Montana Beef Cattle Performance Registry. Puts a group on the same feed and care for the test and then rates them according to gain in weight. If the Yearling Weight Index is 100 that bull will be average as a sire of weight-gaining yearlings. If however, he has an index of 120, he will pass on the extra gainability to his calves. One of his enthusiastic customers is *Wm. B. Ellis,* breeder of Panama Herefords at Cascade, Mont. He ex-

Reprinted by permission from Breeder's Gazette, Spencer, Indiana

plains bull indexing under state college supervision, to me this way:

Master Feeder Knows Every Calf

A group of bull calves 6 to 12 months old are put on full feed for a period of 140 days, giving each animal an equal chance to show his utmost ability to gain. For a complete record of each bull the Milking Index of the mother must be known. This is secured by weighing the calf on the day it is weaned, adjusting to 205 days and correcting to dam's age. After a period of 15 days or so, the bulls are officially weighed and the index test begins. For the next 140 days a record must be kept of all feed consumed so that the feed efficiency can be computed. On the 140th day the bulls are officially weighed off the test. During the test period only natural feeds are used; no growth stimulants are allowed. On weigh-day the daily gain, total gain, feed efficiency and Yearling Weight Index are computed and each animal is graded for type. Both the Montana Performance Registry and the American issue official certificates on all superior gaining bulls and later will also certify their steer calves.

Steers by Certified Bulls Tested

This procedure reveals factors which can not be seen. The certificate shows the I.P.R. (Individual Performance Record) of each bull — milking index of mother, daily gain, total gain, yearling weight index and grade. The owner then knows which bulls will produce high index feeder steers. The feedlot operator can purchase such cattle with confidence in their ability to make fast and economical gain. The I.P.R. of each sire is kept by the State College and is available to all interested parties.

Corn cobs a foot deep in feed lots help keep cattle clean and dry.

Isn't that a sort of 10,000-mile guarantee? If you get up into Grant Co., Minn., be sure and see *Hansen Bros.'* feedlot out from Elbow Lake. There you will find right now 75 head of yearling whiteface steers bred by the Ellis Cattle Co., and all by indexed bulls with a feed ration of 475 lbs. grain to 100 lbs gain. The Hansens will feed these steers for 10 months, keeping records of feed consumed, cost of gain, and finally the dressing percentage and carcass grade.

States Record Performance

Over in Pennsylvania, where they know how to produce grand champion steers in the showring, the farmers are organizing a Beef Cattle Performance Registry. At the organization meeting Prof. *Tom King* explained that it was just like adapting the

D.H.I.A program (Dairy Herd Improvement Ass'n) to beef cattle raising. So it is.

Friends, you have come a long way in beef cattle improvement in the U.S.A. First, you put over the Purebred. Then you established Type, by submitting your cattle to be rated on conformation and conditioning by thoughtful experienced judges from here and abroad. Now, after careful study, the American Angus Ass'n is adding scorecard Classification. Santa Gertrudis have been doing it since prepotent Monkey first began to procreate a breed; and just the other day gave a Florida breeder, *S. E. Thatcher,* a certificate on a bull that from Nov. 1st to March 20th last year put on 487 lbs.—3.48 lbs. a day! Now, I'm convinced, we will add Performance Recording.

Gains Recorded with Pedigree

It must have been 25 years ago that a purebred beef calf could weigh 1,000 lbs. at 365 days of age. Bull calves anyway. Now two of the most careful bull weighers I know — *Robert Haigler,* Washington C.H., O., with Herefords, and *Jas. Lingle* of Wye Plantation, Queenstown, Md., with Angus—say that a 1,000-lb. animal in 12 months makes sense as "a reasonable goal to aim for at this period of the business."

In fact Bob Haigler, now president of the Ohio Beef Cattle Feeders, had one calf dropped on April 6th weighing 90 lbs., that was weaned on Dec. 8th at 725 lbs. and on April 8th pulled down the scale beam for 1,005 lbs. On the regular ration of corn-and-cob meal, soybeanmeal, silage, hay, grass and mineral. No nurse cow. True that was the only one, but *Chas. Haigler & Son* had several that made between 900 and 1,000 lbs. Jim Lingle's Angus calves this year average far ahead of the records which I have reported to you before.

Wisconsin was once spelled Ouiscousin and Misconsing by early chroniclers and is a Chippewa Indian name meaning "grassy place."

It has been clearly developed by now that any of our beef breeds have the hereditary material in their makeup to sire more weight in their progeny at birth, weaning and market.

The problem is to sort them out. Of course, the dairy folk have the scales and Babcock test as accurate, easy measuring sticks; but breeding 2-yr.-old heifers, it takes them 3 years to assess the heritability for milk production. You beef folk can do it in one year, by weighing individuals at birth, weaning, and on feed 140 days.

10,000 Layers — and He Quits at 5 P.M.

Every 20 months, this poultryman sells out and takes a two month vacation . . .

Condensed from New Jersey Farm and Garden

G. A. and *G. D. Payne*

HOW'S this for efficiency? One man and his wife tend 10,000 layers without outside help. They close the hen-house doors every day at 5 p.m. and *still* can claim a 237-egg hen-housed average for each layer! Such is the unique 20-month cycle management pattern evolved by R. P. Bomberger, Waynesboro, Pa., from 27 years' study and experimenting at his Spring Brook Poultry Farm. He says it works just fine.

The plan stresses: (1) Minimal handling of birds to achieve natural vigor and contentment and (2) tight production control, not only as to distance from other poultry operations but regarding traffic within pens and between birds of different ages. It calls for total depopulation at one time. This is followed by a two-month rest, in which *everything* is cleaned and disinfected and allowed to remain idle.

Following this cooling-off period, standard electric brooders are set in pens in which birds are to spend their entire life. Footage is figured at 2½ to 2¾ square feet per mature bird.

Buildings have two chimney-flue-type outlets one foot above the floor in the center of the 1,400-bird pens and eight intake ducts on the south walls above the windows. Adequate ventilation reduces disease outbreaks and lessens care of sugar-cane fiber-straw litter. (Sugar cane is stirred only for baby chicks.) Birds are hardened rapidly. At three weeks, they are completely feathered and require only 80-degree brooder temperature regardless of the season.

One loop of automatic feeder per pen is used exclusively for the 17% protein all-mash feeding program. Feeder is hand-operated for one-half hour periods —only when the trough becomes empty or at 1½ to 3-hour intervals. Mash is delivered to cement-encased grain room in bags by an independent trucker for $1.50 per ton.

Pellets at the rate of six pounds

Reprinted by permission from New Jersey Farm and Garden, Sea Isle City, New Jersey

per 100 birds are mixed with oats at two pounds per 100. The mixture is fed in the automatic feeders at noon. A cup elevator carries all-mash and oat-pellet mixture directly to feeder hoppers on each of the three upper floors in the converted barn and also in the newer four-story hen house. Regulation eight-foot feeders, 2-1/3 lineal feet per 100 birds, contain oyster shell. In addition, another 2-1/3 lineal feet per 100 provide hard grit.

Back in 1929, an hour's wage in the average factory would buy just under 6½ loaves of bread. Now it will buy 11 loaves. The same pay for an hour's work would have bought 18 ounces of beefsteak; today it buys 34 ozs.

Medicated pellets are substituted for ordinary pellets one day a week — with an indication of trouble, every third day. NiCarbazin is fed to growing birds. Vaccination is done through water and by spray methods. Beyond this, Bomberger indicates that he doesn't know how he would handle a severe disease outbreak. He has never had occasion to deal with one!

Day begins for the poultryman after breakfast at 7 a.m. All automatic trough waterers are thoroughly cleaned daily. Eggs are gathered at 7:30 a.m., 1 p.m. and 3 p.m. Birds travel the length of pens to a laying room of similar brightness, where individual-hole nests line the walls. Eggs, in this way can be gathered without disturbing the feeding hens in the main pens. Mrs. Bomberger leaves her grading job to help gather eggs. Laying rooms are opened to birds at 18 weeks.

There has never been a floor-egg problem, nor have broken eggs given trouble, with the exception of the last weeks of the 14 to 15-month laying period. Shell texture is excellent from all birds — hybrid, cross and "purebred" alike. Bomberger is running all three at present. A single contract outlet picks up all eggs at the farm twice a week, as is the case when the entire flock is depopulated. By 4:30 to 5 p.m., all work in hen houses and grading rooms is completed.

No lights are used on growing birds. They are added at 3 a.m. only when layers recede from peak production (twelve 100-watt bulbs on seven-foot pens). Two months before hens are to be sold, lights are used all night.

No general culling is practiced.

Birds were housed in 1951 at an out-of-pocket housing cost of $2.40 per bird in the four-story hen house with Bomberger doing much of the carpentry on buildings and equipment. Expanding

the operation has required constant attention to market supply, demand and holdings. It has required exacting, though simplified, record keeping which must be up to date at all times.

When asked for the "secret of his success" with this system of management, Bomberger replied that it is due to three factors: (1) good, dependable help (recent illness has forced him to turn the entire operation over to a hired man and his wife), (2) good chicks and feed and (3) careful management.

Keeping birds on a 20-month cycle has definite advantages in breaking a disease cycle, providing minimum bird handling with consequent savings in labor and benefits in maintaining a vigorous bird, achieving a two-month rest period for labor and buildings, uniform vaccinating and lighting procedures, uniformity of daily routines, which means work is completed more quickly, and in gaining the advantage of quantity pricing of commodities and supplies.

By the same token, it is a program for none but the expert. It requires an extensive and sensitive knowledge of poultry and individual bird welfare, a sizeable amount of fluid capital for the growing period, more brooding and growing equipment than is necessary on a multiple-hatch system and a flexible marketing outlet that will absorb all eggs and fowl with fluctuations in supply.

Can this system be used in these times of lowered fowl returns? Bomberger is entering his fourth year with a white bird on this system and remains satisfied with the results—a yearly average production of 237.3 eggs per hen housed, 9% hen-housed mortality, 80% production after four months of lay and a return which has, through the years, yielded an amount to cover the regulated expansion program!

Visitors who have seen the Bomberger operation have speculated that such a system might be the forerunner of tomorrow's "contract egg farm," in which there will be a definite break in the laying cycle and a workday that more nearly approximates that of other industries. They envision perhaps even higher layer populations per couple — 12,000 birds or more—if central grading stations take the cleaning, grading and packing chore off the farm.

By staggering contracts among efficient producers, say these folks, the contractor can maintain a relatively uniform supply of the kind of eggs he wants.

Bomberger, and skilled operators like him, would have no need, of course, to resort to the contract system if it were to develop.

Breeding for Size Comes First In Denmark

The Danes follow these basic breeding and showing principles:

1. **Of two equally well-built animals we give first place to the bigger one.**
2. **A well-built animal, provided it is not undersized, is always preferred to one less well-built.**
3. **Neither pedigree nor yield is allowed to influence the prizewinning list.**

Condensed from Dairy Farmer (England)
As told by *Hansen Larsen*

THESE three selective principles have given extremely successful results in Danish cattle breeding all through the present century; indeed it is due to them that the Red Danish dairy breed has a large and all-round output.

In breeding beef cattle one selects for size and weight, for broad and robust hindquarters and sturdy back. But the importance of size when breeding dairy cattle, is not immediately apparent.

Those who contest the value of the large cow advance two main arguments:

First, the small Jersey cow can sometimes produce a very large volume of both milk and fat.

Secondly, even in the same breed there is by no means always a correlation of size and yield within a range of 220-330 lb. weight of body.

Both objections, of course, are right. We often get a smaller milk yield from the large and heavily built cow than from one of medium size.

Nevertheless, it is a mistake to make this a principle of selective breeding.

To extol the medium-sized cow with a high yield, at the expense of the large cow in which we have failed to combine all the many yield characteristics, is natural.

Reprinted by permission from Dairy Farmer, Lloyd's Chambers, Ipswich, England

But we are deceiving ourselves if we base our breeding principles on it. Although a small cow may give a high yield, this can never reach great heights unless the cow continues to grow.

Breeding for size must therefore come first, being a basic condition for the utilization of the combined high yield characteristics.

The African Congo has a locust that grows 6 inches long and devours birds and mice.

It obviously requires a certain organic bulk to produce a given yield of milk; hence there is a correlation between milk yield and body weight. Our breeding principles should be adjusted accordingly.

I am able to give some figures which support these views.

In our progeny tests we have a careful check not only of the yield of first-calving heifers, but also of their weight.

The heifers were weighed on three successive days after calving, under uniform feeding and management conditions. They were of fairly uniform feeding standard, and in grouping them no account was taken of pedigree. The average yields were for 304 days.

The figures for 1948-50 are in the table below.

The figures show a clear trend; as most of the groups are fairly large, the differences, regarded as averages, are rather considerable. But the advantage of the large cow is not only that it is capable of the largest milk yield, though this is easily the main consideration. It has two other outstanding advantages:

In the first place, a large cow means an all-purpose production, the amount of meat, hides and offals being directly proportional to the animal's size.

In the second place, a large cow can utilize more coarse fodder in the form of grass, beet, hay and silage than the small cow; a factor of great importance in times of high prices of concentrates.

No. of heifers	Bodyweight (lb.)	Milk (lb.)	Fat (lb.)
117	882 and below	8,688	377
376	884-992	8,932	386
306	994-1,102	9,371	406
73	1,104-1,212	9,676	421
14	1,215-1,323	10,604	459

In our progeny tests, in fact, Jersey cows are shown to be about 300 feed units lower in the consumption of coarse fodder than Red Danish dairy cows.

With regard to the first point, the market trend in cattle production over the past 25 years has moved strongly in favor of the large cow with the heavy milk yield, because meat, liquid milk, milk for cheese-making and skim-milk have all risen rapidly in importance and value. Meat production would hardly have risen, had we not taken account of build in our breeding.

The ideal cow would therefore be one with an annual milk yield of 15,500 lb. and a lifetime of seven years. It is old-fashioned and out of date to keep them until they are 14. One should not be reluctant to sell while they are good beef cattle.

Far More Profitable

Our experience of cattle breeding tells us, and tells us clearly, that while not all large cows give a high milk yield, practically all cows that do have a high milk yield are large ones.

Our record Red Danish, *Stensbygaard No. 294,* is a case in point. All the milk from this cow was weighed, and the fat content was established.

At the age of seven, she yielded in 365 days 26,171 lb. of milk, 4.57 per cent fat and 1,345 lb. of butter, the equivalent of 28,403 lb. of 4-per cent milk; and she weighed 1,771 lb.

Owing to her considerable weight, she was never fatigued by her high yield. She was therefore a very valuable cow, both as a meat and butter producer; and because of the skim-milk she was, by Danish practice, a most efficient bacon producer.

It requires a large body to produce over 28,000 lb. of 4-per cent milk a year.

Young pigs start needing extra nutrients for proper growth and development at about four weeks of age, say Michigan State swine specialists. They recommend that a good creep ration be made available to the pigs.

Our 20 record cows at Stensbygaard averaged 1,555 lb. in weight. In two record years they gave an average of 22,910 lb. of milk of 4.61 per cent fat, and 1,246 lb. of butter, equivalent to 24,991 lb. of 4-per cent milk.

These are ideal cows. They were never exhausted by heavy yield, because weight of body, ability to convert and the yield itself were so well matched; everything was well balanced. Several of these cows were periodically capable of utilizing up to 25 feed units per cow per day.

Here then the maintenance food is only 20 per cent; whereas in other, medium or small cows it is usually 40 per cent.

The Stensbygaard figures clearly show that a large cow with a high yield (so often condemned because of large maintenance consumption) is far more profitable than the smaller cow.

The large cow gives us about 110 lb. more milk per feed unit than the smaller cow.

Egotism is what enables some people to put up with themselves.

Consequently, it is easy to see why—at cattle shows and in general selective breeding—the large animal has been favored.

What "Well-Built" Means

Now I come to the second of our guiding principles—that of a well-built cow. The natural thing to do is to set out our starting-point and our ideal. Our present position is somewhere between the two.

The small and primitive dairy breeds, with a small yield of milk, are thick in the middle and pointed at both extremities, especially behind, and they have poorly set limbs.

Cows of this quality failed to satisfy the requirements of intensive cattle breeding. They had to be bigger, heavier, more robust and more productive.

To set about improving features in the build which would afford the best possibilities of increasing weight and vigor, logic required that the fore part should be broader, the hind-quarters broader and stronger, the back more powerful.

Hence it was essential to concentrate, in selective breeding, on these three parts of the body in order to improve production. It would have been illogical to make the middle part, already large, even larger still. This was not the way to make the cow more robust.

We therefore set ourselves the aim of producing a body with a straight top line (a policy which meant strengthening the constitution) and an improved position of the anus and vaginal aperture.

We aimed at a loin that would be broad and flat—an important requirement if the cow was to be both stronger and heavier.

It also meant more room in the pelvic aperture, and hence fewer delivery troubles than in the case of cows pointed at the rear; it meant well-set and widely-spaced back legs; and finally the broad loin and widely-spaced legs left plenty of room for a large udder.

For all these reasons we persevered to obtain a broad, flat and straight loin. Our experience

seems to suggest, however, that it is extra-ordinarily difficult to develop and fix this feature. Some of the other characteristics of both build and yield have been much more easy.

The deep mid-part, which we found easy not only to keep but to develop, and which we wished to have in our cows, counteracted, however, our attempt to achieve a strong back and straight loin. Still in the last 20-25 years we have had no small success in getting a fairly strong and straight back.

But it must be borne in mind in this connection that the more characteristics we desire to develop at one and the same time, the slower and more difficult it will be to achieve our aim. So it may not be remarkable if occasionally we find progress towards our ideal too slow.

Nevertheless, we shall probably advance just as quickly by taking all the characteristics (by selecting, that is to say, for "all-round impression"), as by following up one or two characteristics at a time.

Consequently, in all our important cattle shows since the beginning of the century we have awarded points not for individual features but only for "size" and "general impression."

Importance of "Utility"

So far I have confined myself to size and features of build. But there is more to it than these; judgment of build also includes utility.

Cost per ton should not be the only buying guide for fertilizer. High analysis fertilizers cost more per ton, but less tonnage will be needed to cover the field with the same amount of plant food, compared to a low analysis fertilizer.

Utility is a factor which we neglect at our peril. If the principal object is to breed dairy cows with a high potential yield, we should aim at a long, open body which should not be weak.

It is rather difficult to say why this should be so, but all the experience tends to confirm this rule, especially an investigation into 100 society bulls of Red Danish dairy breed which were used to excess, though most of them were judged under-sized at shows, and so were badly placed.

The investigation plainly showed that the small bulls bred an inferior yield to the large bulls of good dairy type; just as the thick-set bulls bred a substantially poorer yield than the bulls of dairy type. The large bulls of

good dairy type were certainly the most reliable breeders both of size and milk yield.

We are therefore in no doubt that the selective principles in our national dairy breeds should be these:

1. Selection for size.

2. Selection for regularly deep, broad and vigorous body build.

3. Selection for dairy type.

These three factors we pursue simultaneously and probably with equal intensity; but we never mix them.

We keep selection for yield by itself; and naturally it is based on material from milk recording and progeny tests. Selection for size and builds is also kept separate, and this is based on three measures: shows, awards for cows in elite herds, and the description and measurement of cows for herd books.

We know that nearly everything in the build is inheritable, including localized weaknesses; and we act accordingly.

Early or Late Corn?

Early maturing corn hybrids yield just as well or better than late maturing hybrids, according to Elmer Rossman, farm crops specialist at Michigan State University.

Many farmers compare corn by the size of the ear which is often misleading, Rossman says. Late maturing corn retains moisture longer than early corn and the higher moisture content makes the ears larger and heavier than the drier early corn.

Ears over one-half pound indicate the corn was not planted thick enough to get the top possible yield so large ears may actually indicate lower total production than a field with smaller ears.

Rossman says late frosts in past years have lured many Michigan farmers into using later maturing corn hoping to get higher yields. Killing frosts near the normal frost date the last two years have pointed out the problems of handling immature wet corn.

Early maturing corn offers several advantages: (1) Drier crib storage due to lower moisture content. (2) Earlier harvest which means less harvest loss from lodging and bad weather. (3) Mature corn is better feed than soft corn. (4) Less moisture means less discount at the elevator. (5) Less expense for drying. (6) Early harvest offers a better chance for fall plowing and seeding.

—Michigan State University

What's the hullabaloo about VERTICAL INTEGRATION?

The trend toward off-farm control of producing broilers, hogs and eggs is alarming some farmers. Others like it. Few can ignore it. Here's what it may mean to you . . .

Condensed from Successful Farming

Wayne E. Swegle

SOME people say that vertical integration, or contract farming, will be the ruination of farmers — others say it will be the salvation of agriculture. Most of us haven't yet formed an opinion. But vertical integration is a very real threat, or promise, and may affect your farm operation sooner than you think.

What It Is

Let's see how vertical integration would apply to your operation. Say you now buy feeder pigs for finishing out. You buy whatever protein supplement, equipment, and housing you choose.

You decide when to buy pigs, whether to raise them on dry lot or pasture, and when and to whom to sell your fat hogs.

If you sell the hogs direct to the packer, he butchers them, and sells them through the marketing channels to the retail grocer who sells the meat to the ultimate consumer.

Now let's suppose someone, a feed dealer for instance, decides to integrate this chain of events or parts of it.

- He goes to the man who raises feeder pigs and makes a contract with him to buy so many pigs of a certain quality at specified times at a set price.
- He makes a contract with a local chain of grocery stores to furnish them so much pork of a certain quality every week at a certain price.
- He makes an agreement with a small packing house whereby they butcher the hogs and prepare the pork for a certain price per hog.
- And then the feed man comes to you. You agree to take his feeder pigs at a certain time, feed them the ration he has proposed, care for them just as he says, and in return he'll pay you

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so much per pound of gain. He has the veterinarian call at your farm regularly, and he sends around a manager occasionally to check up on sanitation and other details. You may have to buy a certain set of buildings and equipment, too — for which he may have arranged a loan at the bank.

This is vertical integration. The feed dealer is the integrator —he has gained effective control of several stages of the supply-production-marketing chain. He has done it with contracts.

You have given up some of your freedom to make decisions in the hog business. In return he has given you a guaranteed price. If you can put on gain for what he offers, you are assured a profit.

Now let's look at some of the different forms integration can take—because you may think it bad in one form and good in another.

How It Works

You've probably heard about integration in the broiler industry. Some similar arrangement may be applied to hogs or other livestock.

This is how it works in the 14 small Delaware, Maryland, and Virginia counties that make up the famous Delmarva Peninsula:

WHERE INTEGRATION IS GOING

Here's how Purdue University agricultural economists rate the potentialities of integration:

Broilers: At least 80 per cent production is under control of a contracting integrator. Development will continue in refinement of contracts.

Turkeys: Increasing attempts at integration will be made — probably similar to broilers.

Eggs: A few examples now exist. Potentialities of standardized management, product control, and rapidity of technological change make increased integration efforts very likely.

Hogs: Scattered integration attempts now are under way in hog feeding. New technologies in feeding practices may be on the horizon — which could give increased incentives for integration efforts by processors and feed companies. Growth will be slow and spotty.

Beef: Some packers now operate feeding operations. Though it doesn't appear that extensive integration will develop immediately, experimental attempts in fattening cattle under contract bear waching.

Dairy: The dairy industry already is highly organized and, to a considerable extent, operates under milk control orders. So no major new integration development seems imminent.

Grains: Little or no attempt has been made to integrate in this area nor seems likely soon.

Some of the integrators or financiers there are feed dealers who want a steady supply of feed customers, some are farmers who have proved to be such good managers that they've built hatcheries, feed stores, and even processing plants as their broiler flocks have multiplied. Other integrators are hatcherymen who want to sell chicks—and still others are dressing plants who want a steady supply of broilers for processing.

The integrator will provide the grower with chicks, feed, fuel for brooder stoves, bedding material, and medications. The grower provides only his broiler house, equipment, and his time and skill to look after the flock. In return, the grower gets a guaranteed flat fee per thousand birds for raising the flock, plus a share of the profits, if any, and an occasional bonus for producing high-quality birds.

Here is another example: Arrangements between an egg producer and an integrator may state that the poultryman must have certain equipment, that the farmer take so many chicks of a certain kind, and that the flock be fed and handled in a particular manner. In return the grower gets a specified price, or a premium over a specified quotation.

Other variations or examples of integration include: contract feeding operations where a packer may buy feeder cattle and pay a cattle feeder to put a certain finish on the animals; a farmer who starts his own egg-grading setup and sells his eggs directly to the consumer; or the cooperative which takes eggs from its members, grades and cartons them, and sells them to the retail grocery chain.

Some new corn hybrids now under development at the University of Illinois will contain 30 per cent more oil and 10 per cent more protein than normal hybrids. Yet they will yield and stand as well as normal corn.

As you see, integration can be controlled by a farmer or a group of farmers, a feed dealer or other supplier, a processor, or any of several others. The successful integrator must have two things, among others: (1) management ability to make this arrangement work and pay off, and (2) money.

We've seen just what vertical integration is and how it works—now let's see why it is, the reason for these changes in agriculture and related businesses.

Why It's Coming

One of the earliest examples of vertical integration on a large scale in agriculture was in the

vegetable industry in southern New Jersey around 1940.

A large processing firm moved into the area and bought land which encompassed about 350 vegetable farms.

The firm wanted uniform, high quality produce—which it could not get from the individual farmers. The company standardized the varieties grown, the field treatment, the time of harvest, and other important factors in producing a product suitable for freezing.

North Carolina is the only state with an even 100 counties.

The same farmers who formerly owned the land worked for the company for a wage after selling their land. The farmers lost their independence but they gained an income. The company had a greater investment and took on more risks, but it got a high-quality product it could use.

So control of quality was one of the first reasons for integration and contracts.

Another reason is to even out the supply of a product for processing, and for the consumer market. Beef cattle feeding is largely a once-a-year proposition. Hogs hit the market more heavily in the fall and winter months. Chicken used to be a delicacy enjoyed only during certain months of the year—it's now a year-around item in the city family menu, largely because of integration.

Another important factor bringing on integration is emphasized by Earl F. Crouse, vice-president of Doane Agricultural Service, Inc. He says, "Production contracts eliminate the gamble of market price fluctuations. Operating margins and costs are determined before the wheels of production begin to turn. Instead of the farmer spending his money and throwing himself on the mercy of the markets with a 'What am I bid?" integrated poultry producers have taught him to say 'What is the contract price? I know my costs and if you'll tell me what you'll pay, I'll tell you whether or not I am interested."

Another key to the advance of integration is the advance of technology. We now know how to erect barriers to disease, to handle large quantities of feed with little labor, to standardize management procedures.

One U.S.D.A. expert says we are at the point with hogs now where the broiler business was before World War II. He believes one of the biggest problems with hogs will be in getting enough uniform, high-quality, disease-free feeder pigs.

This brings us to a logical point to see what this development may mean.

What It Means to Farmers

Here are some of the probable consequences of integration in the future.

- For farmers who have the ability to produce efficiently, but who have lacked financing, equipment, or technical information, integration will offer a way to overcome these handicaps and operate larger, more efficient enterprises.

It also may help beginners with these basic abilities to get a start in farming.

- For farmers who are "below average," even if they have financing and help, integration will simply hasten the day when they will have to find better employment. It may be a mistake for these farmers to try to save themselves through integration—they may lose their investment and time in the effort.

- Successful integration will speed up the changes now under way in agriculture—such as the tendency for more standardized operations and products; the pressure to specialize and increase the size of business; and the necessity to continue to adopt new and improved technology.

- Integration probably will result in increased geographic concentration of production. That is, competition between regions will be intensified and the areas with higher costs will lose out faster.

A shortage of hay and higher prices by 1959 can result if present plans to plow up extensive acreages of alfalfa are carried out. This suggestion to go slow on turning under hay seedings comes from a State of Washington price specialist.

"Nearly everyone is pessimistic about hay prices for many years into the future. Nearly always when that happens a big change in the supply and the price occurs much sooner than expected," he points out.

- If you live in an area where integration of a particular product develops to a point where it covers most of the production in your area, and you prefer to remain independent, you will find it increasingly difficult to get supplies and find markets at favorable prices. There will be fewer facilities to serve you.

- So long as you can choose between several integrators in your area, competitive conditions may remain as vigorous as ever.

However, if a few integrators gain control, then all of the potential evils of monopoly may exist.

Purdue economists believe integrators will not try to organize areas where there are now highly specialized and efficient producers. The better farmers, and interested nonagricultural agencies in these areas, will find it possible to get the advantages of integration through various arrangements which will still *leave effective management in the hands of skillful and competent managers.* How such areas will fare over the years after integration gets well established is not certain.

Remember this: Integration does not make a small, inefficient farm business profitable. Management remains a scarce resource. Whoever can supply this management most effectively will retain or gain control.

Artificial Breeding Rules

A dairy farmer can follow a number of rules to make artificial breeding more effective, according to Norb Moeller, Purdue University extension dairyman.

He lists these general rules:

Don't attempt to have the cows rebred until 60 days after calving — it takes this long for the reproductive organs to recover.

Keep a close check on animals for heat symptoms and call the technician as soon as the cow is noticed. Be sure to let him know when the heat period started. Cows housed in stanchion barns should be released at least once a day so the dairyman can observe them for heat symptoms.

For the best results cows should be bred close to the end of the heat period or within 12 hours after the close of the period. Individual cows vary however, and many need to be managed accordingly.

Veterinarian help is especially important for cows that have failed to conceive on three consecutive breedings. Ideally, cows should be checked for pregnancy 60 to 90 days after breeding.

In Indiana, non-return rates on first service are averaging 70 per cent, Moeller adds. This is as high as can be expected from natural service, he points out. —*Farm News from Purdue*

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What To Do With Wet Corn

Wet corn makes top feed. If you can't get it fed, here are ways to handle it before a spring thaw causes spoilage . . .

Condensed from Wallace's Farmer

Jim Rutter

LOTS of folks are feeding high moisture corn this winter. And it is putting on gains every bit as fast as dry corn.

In fact, feeding experiments at Iowa State College showed 8 per cent greater feed efficiency with feeder cattle getting high moisture corn.

While the rate of gain didn't increase, the animals consumed 8 per cent less feed. This means valuable savings in any feeding operation.

"On a dry matter basis, high moisture corn is at least equal to dry corn," says Dr. Wise Burrows, cattle feeding specialist at Iowa State College.

Cattle in the tests preferred eating the wet corn, too.

"Less of the high moisture corn is apt to pass thru the animal since it is digested easier than hard-shelled corn," points out C. C. Culbertson, Iowa State College. That probably accounts for much of the added efficiency.

While cattle make the best use of high moisture corn, it's also a good feed for hogs and lambs.

Swine may eat a little less, but they will still make satisfactory gains on wet corn.

Continue to feed the corn if it begins to show some damage from heating. Illinois tests show that both hogs and cattle will eat moldy corn and maintain a satisfactory rate of gain.

Wet corn is also a satisfactory feed for lambs. But it might be dangerous to give them any moldy corn.

High moisture corn behaves about the same as dry corn. So it may be fed with the same methods.

All of the experiments were with ground ear corn. But high moisture corn performs as well when it is shelled and ground.

Werner Poehler, Fayette county, Iowa, says he'll be feeding high moisture corn to feeder cattle this winter.

"I'll feed it as ground ear corn. And most of it will be

Reprinted by permission from Wallace's Farmer and Iowa Homestead, Des Moines, Iowa

gone by spring," Poehler adds.

But that's not the case for many folks.

Clarence Kutcher, Johnson county, Iowa, is feeding high moisture corn to feeder cattle and sows. "I'll try to keep any that is left next spring from spoiling by moving it around," figures Kutcher.

That may work out for folks with only a small quantity of wet corn left to worry about. But many will have too much wet corn to keep down spoilage by this method.

For them, ear corn silage is a possible answer. It can be stored in a conventional silo. Most silos will be empty by spring.

This is a practical method of saving and storing wet corn to feed next summer.

Since wet corn will keep pretty well this winter, ensiling can be done any time before the first big thaw.

Here is another solution. Erwin Giesemann, Buchanan county, Iowa, says he will feed as much as possible to his stock before selling the remainder at a discount.

Wet corn will be discounted—but this might be better than paying too high prices for feeder stock.

Compare the cost of drying against wet corn discounts. Putting your wet corn thru a custom dryer can bring a good profit when discounts are too high.

Also, if you stayed within corn acreage allotments, some of your high moisture corn may still be eligible for a CCC loan.

Corn up to 20½ per cent moisture can be sealed now. Toward spring the maximum moisture level decreases.

Here is maximum moisture content permitted at time of testing:

Jan. and Feb.	20½%
March	19
April	17½
May	15½

If corn exceeds these limits, it can't be sealed at that time. However, it can be retested at a later date.

New rules for grade No. 3 or better corn allows support to be extended on corn with up to 15 per cent damaged kernels, including a 3 per cent heat damage.

Corn is sealed at the same price regardless of moisture content. But a bushel dock is applied to allow for decrease in weight due to moisture loss before delivery. The higher the moisture, the greater the dock.

You are responsible for the condition of the corn until it is delivered. So if it doesn't dry out enough to avoid spoilage, a grade and price adjustment will be made at delivery time.

Are Poor Valves Hogging Your Tractor Power?

Here are things you can do to increase the life of the valves in your tractor engine . . .

Condensed from Wisconsin Agriculturist
Melvin Long

GOOD valve performance is essential for proper operation of your tractor. Leaky valves increase fuel consumption and reduce power output.

In a four stroke engine, the pair of valves for each cylinder must do several things for each two revolutions of the crankshaft.

For example, they must open to admit fuel and air mixture (or air only for a diesel), seal tightly against the pressure built up during compression and ignition of the fuel, and then open to permit the burned gases to leave the cylinder in order to make way for the next incoming fuel charge.

In general, you'll have little trouble with the intake valve because the incoming fuel charge (or air) is not excessively hot. However, the burned gases that rush past the exhaust valves are at a very high temperature.

It is generally the burning and warping of the exhaust valves that is the cause of valve failure. Here are some things that you can do to increase the life of the valves in your tractor engine.

- **Avoid Overloading**

Prolonged operation at excessive loads will increase valve temperature and lead to early failure.

- **Avoid Abrupt Engine Stops**

If you have been operating at or near maximum engine capacity, don't shut off the engine without allowing it to idle without a load for a few minutes.

Reprinted by permission from Wisconsin Agriculturist, Racine, Wisconsin

This no-load operation gives the cooling system and the oil a chance to carry the excess heat from the engine block and cylinder head.

Otherwise, the reservoir of heat contained by the block and head will often be enough to warp the much smaller valves before the entire engine cools.

About 300 tornadoes strike someplace in the United States yearly.

● **Adjustment**

Valve clearance adjustment is very important. If enough clearance isn't provided the lengthening of the valve stem when heated will prevent the valve from seating properly. This allows the hot gases to flow past the valve thus overheating it.

● **Excessive Heat**

The excess heat which is generally the cause of valve failure can also result from an inefficient cooling system.

The valves in an engine are cooled by the coolant liquid passing through the engine. If the liquid is not properly cooled in the radiator, it may not carry enough heat out of the engine to prevent valve failure.

Common causes of poor cooling are such things as loose fan belts, dirt in the radiator core, and scale or rust in the water passages of the radiator.

● **Carburetor Adjustment**

Too "lean" a setting of the load needle can cause burning of the valves. The correct mixture of air and fuel is necessary for combustion to take place completely. in the time allotted during each cycle.

If the mixture is too lean, it is still burning when the exhaust valve opens. This, of course, greatly increases exhaust valve temperatures.

● **Ignition**

"Late" spark timing has the same effect as the slow burning lean mixture. It's important that the entire ignition system be in good working order and properly adjusted to make sure that ignition of the fuel charge takes place at the time.

● **Water**

One source of damage that is frequently overlooked is the water that runs down the vertical exhaust of a tractor left out in the rain.

This water may run down into the cylinders. When you try to start the engine, the water generally causes the failure of some part of the engine.

A tin can placed over the exhaust stack will prevent this type of damage. There is also available a "flipper" type cover which closes when the engine is stopped but is held open by the force of the exhaust gases when the engine is operating.

● **Gum**

Gum formation from the fuel can cause sticking and burned valves. The easiest way to avoid this problem is to use fuel from a good supplier.

Plan your fuel storage so that you don't store the fuel over four months. A shaded storage tank reduces evaporation and thus decreases gum formation.

● **Valve Rotators**

One of the most simple ways of increasing valve life is to use a device on each exhaust valve known as a valve rotator.

This rotator turns the valve slightly each time it operates. This prevents the build-up of carbon deposits on the valve face and permits the valves to seat properly.

This correct seating prevents the "blow-by" of the hot exhaust gases, thus greatly increasing valve life.

Most new tractors are now equipped with rotators, and they are available for most older tractors. When you have an engine overhaul job, you should definitely consider installing rotators when the engine is reassembled.

Rotators do wear out eventually, and should be replaced at each major overhaul. However, a rotator that is not working does no more harm to the valve than if it were not present in the first place.

Remember, however, that rotators are not a "cure-all," or excuse for poor valve care. It will still be necessary to observe the points previously mentioned.

More Plants Spell Bigger Corn Yields

Many farmers are not planting enough corn per acre to get the top yield, says Stuart C. Hildebrand, farm crops specialist at Michigan State University. The top producing plant populations vary with the soil but, in general, corn populations per acre are too low.

Hildebrand recommends these five steps for getting the desired plant population and top yields:

1. Using high grade quality, well graded seed.
2. Use seed treated with an insecticide-fungicide.
3. Plant at a uniform speed of three miles per hour to get uniform distance between plants.
4. Place the fertilizer properly in relation to the seed. Too much fertilizer in the row with the seed may cause seed injury.
5. Increase the seeding rate by about 10 per cent over the plant population you are shooting for. This margin will take care of seed mortality.

—Michigan State University

Impressions of Farm Mechanization in Russia

About 60-foot hay rakes, 33-foot mowers, 12-ton trailers and three-phase milking machines . . .

Condensed from Agriculture (England)

C. Culpin

MY fortnight's visit to Russia, last June, even though it included a journey from Moscow to the eastern end of the Black Sea, is inadequate to qualify me as an expert on Russian farming. My views must, therefore, be accepted merely as personal impressions and this article merely an attempt to make objective comparisons between the Russian way and our English way, with the limited amount of information at my disposal.

Collective Farms and Machine and Tractor Stations

There is now practically no such thing in Russia as a farm belonging to a single individual. Broadly speaking, all land of any consequence is either part of a State Farm or part of a Collective Farm. Not only are there no owner-occupiers: there are no tenant farmers either, in our sense of the word. It is thus well that from the outset the reader should understand just what the term "collective farm" implies. One visited in the region of Kharkov, which may be regarded as reasonably representative of the system, consisted of about 6,400 acres cultivated by 500 collective "farmers." Though, in theory, all workers have a voice in how the farm should be run, general management is in the hands of the chairman, and he has working under him managers of the various main departments which in this case included milk production, vegetable growing, pig production and poultry. The farm is run as a unit, and no worker is concerned more than temporarily with any particular part of the land. All the important work on cultivation is done by the local Machine and Tractor Station (M.T.S.) which, with its 75 tractors and a wide range of equipment, looks after the needs of ten collective farms within a radius of about 15 miles of its headquarters.

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The Machine and Tractor Stations, in addition to the people concerned with the machines themselves, may have on its staff various experts who are concerned with trying to see that the work done produces good results. For example, there may be crop husbandry experts, animal husbandry men who are also veterinary surgeons, and other "advisory" staff where the need is thought to justify it.

A hen must drink nearly a pint of water to make an egg, poultry specialists assert. Egg production slumps if the layers find solid ice instead of water in fountains or troughs.

In spite of all these M.T.S. people who are concerned with running the collective farms, it is the chairman of the latter who is the "boss," once the M.T.S. contract has been argued and signed. The M.T.S. tractor drivers, for example, are responsible to him or his department managers, and they normally live on the farm and work there continuously from April to October.

The collective farms have their own stationary equipment such as electric motors and milking machines; and a concession recently granted as an experiment is permission for them to have a few of their own small wheeled tractors. They pay the M.T.S. *in kind* for the work done, and this payment, as well as the taxes payable directly to the State, usually represents a percentage of the output of the particular commodity. When all taxes and other dues are paid, and each of the collective farm workers has been rewarded according to regular scales for work done, a meeting decides what to do with any surplus. Needless to say, it is likely to be easier for a farmer who is a member of the Communist Party to rise to the higher posts or to influence policy in lesser roles.

State Farms

The State Farms differ, in that most of the machinery is owned and operated by the farms, and the workers who are paid the rate for the job have practically no concern with the financial results. As a general rule, State farms are favored where there is no large settled population and where the work to be done by machinery represents a very high proportion of the total cost of production. Thus, State farms predominate in the regions of vast grain-growing lands (for example, near Rostov) and also in underdeveloped regions such as the tens of millions of acres of the "new lands" which are being brought into cultivation towards the east.

All the State farms that we saw tended to be rather exceptional: for example, one near Kharkov called the "Ukraine" is famous for the quality of its stock. This farm of 17,000 acres has 500 workers. The chief crops are winter wheat, maize, meadows including alfalfa, cereal, legume mixtures for fodder, fodder beet and sunflowers. There are 1,500 cattle (660 cows), 3,000 pigs (Large White crosses), 6,000 sheep and 3,000 poultry. Milk yields were much above the general average, at about 1,000 gallons.

During the average year, 1/6 of the farm crop acreage is sprayed, dusted, or fertilized by aircraft.

Haymaking

At the "Ukraine" haymaking was going on, the equipment used being (1)a gang of three trailed 6-feet cut mowers, each with a rider, pulled by a 54-horse-power crawler; (2) a tractor-drawn dump rake 60 feet wide which ran along the partly-dried swaths and put them into windows; and (3) a tractor sweep for collecting the crop from the windrows. Alternative equipment was a new self-propelled, pick-up baler that was being tried out and a pick-up cocker which works on swaths or windrow according to need.

At another large State farm not far from Rostov I saw more up-to-date hay-cutting machinery, with cutter-windrowers grouped around the crawler tractor, so that about 33 feet of crop is cut and put into two windrows. On the thin lucerne (alfalfa) crop where the machine was working, the windrows were not very thick, and after a few hours' drying they were ready for picking up by a pick-up cocker. There followed a front-attached stacker with a very high vertical lift, which deposited the large cock on an enormous trailer mounted on two multi-wheel axles. The trailer, which was pulled by another large crawler, was then towed to a suitable point where the complete load of about 12 tons was shipped bodily by hoisting up the front through a built-in winch. These methods are clearly quite unsuited to countries like ours, and I could not help wondering whether smaller and more flexible equipment would not have been much better there.

Heavy Equipment

This, indeed, seemed to me to be in some ways typical of the Russian scene. Many of the haymaking problems there really stem from the fact that hitherto the main unit of power has been a 54-horse-power crawler tractor —a good machine for ploughing and heavy cultivations, but hard-

ly suited to hay harvesting. In their efforts to provide an adequate load for such tractors, the Russians have developed very large machines of many kinds. For example, one of the most popular trailed combine harvesters, with its straw-collecting tank, weighs 7½ tons. The Russians fully appreciate the problem, and are planning to alter drastically the ratio of wheeled to track tractors by 1960. Of their present 850,000 tractors, about 25 per cent are wheeled; by 1960, when they intend to have 1,200,000 tractors, about 65 per cent are to be of various wheeled types — mostly equipped with pneumatic tires, hydraulic lift and three-point linkage.

In the meantime, they tend to be several years behind us in most aspects of mechanization, though they are breaking new ground with developments in a few directions, such as with machines for harvesting corn and cutting and collecting the stalks for silage.

Three-Phase Milking Machines

Another Russian mechanization development which I believe is unique, is what they call the three-phase milking machine. Russian physiologists, working closely with the machinery people, have come to the conclusion that all the machines currently used in the rest of the world are fundamentally wrong in principle because of the tendency of the teat-cups to creep up the teat and constrict the blood vessels of the udder. They maintain that the consequences of this action are so disastrous in respect of udder diseases that one dairymaid can be trusted to handle only a single unit. The result is a maximum milking of ten to twelve cows per hour. At present there is a tendency in Russia to ignore the point that this does not correspond with the real facts in countries such as England, where one man often handles three units.

Filling the tractor fuel tank at the end of each day's work will reduce water condensation during cold weather.

In any event, the Russians have developed and are now using on a rapidly increasing scale a machine which incorporates, in addition to the two phases with which we are familiar, a third phase of complete rest, where pressure both inside and outside the liner is atmospheric. This certainly achieves its object, for with it the teat-cups tend to fall off the udder, and have to be supported in place by a surcingle. Regardless of whether their hypothesis on two-phase milking is correct, the Russians are satisfied with their three-phase and are

using a good deal of propaganda to get the dairymaids up to the target of milking twenty cows per hour with two units. The research going into the problem will inevitably lead to progress, but in the meantime rather a lot of dairymaids are still employed for milking, even with the new machines.

A noteworthy development which follows the trend in many parts of the Canadian prairies is the use of the windrow method of harvesting grain crops. The Russians are so convinced that this is the right method, that they are now measuring their progress in harvesting mechanization by the percentage of crops harvested by the two-stage method. They estimate that in their conditions the windrow method saves from 2 to 25 per cent more grain than direct combining.

Catering for Progress

Directions in which impressive progress is being made include some which are fundamental to securing greater success in the future. Even allowing for the fact that research institutes, testing stations and teaching and training centers must contribute more than where a private manufacturing industry carries out a great deal of such work, it seemed to me that the establishments concerned with such matters were gradually being equipped to cater for progress and not merely for maintaining the present situation. Along with good work that is being done on such day-to-day problems as repairing machinery more economically, there goes more fundamental research aimed at the introduction of new techniques and new machines.

Moreover, the Russians do appreciate, very much more than is general in Britain, the vital importance of good teaching of farm mechanization. Alongside the famous Timirazev Academy near Moscow, where 2,000 students attend for their five-year degree courses in various aspects of agricultural science (for example, crop and animal husbandry, and plant pathology), there stands the Institute of Mechanization which also has 2,000 students, most of whom take a five-year training course in farm mechanization.

It can be argued, of course, that if more students were trained in other aspects of agriculture and less in mechanization there would be fewer crop failures. My personal view is, however, that apart from a few points like using more fertilizer, more progress is still likely from mechanization developments than from other more scientific advances.

Fecundity Is First with Pigs

This English farmer gives some practical advice, valuable to hog farmers the world around . . .

Condensed from Pig Farming

Anthony Phelps

GOOD grading is all very well, but if you want to establish a profitable pig herd the first points to concentrate on are fecundity and mothering qualities. Get these factors established in a strain to start with, and *then* you can turn your attention to conformation.

That may not be the academic method but it is a sound, practical principle and the one with which Mr. John Hudson, of Felin Ban, Cardigan (British Isles) built up the Felin Herd of pedigree Wessex, Welsh and Landrace.

Mr. Hudson's aim is to produce the sort of breeding pig which suits the average pig farmer in both price and performance. No hot-house plants, but sturdy, docile, prolific and, above all, economic stock.

Last year his 25 sows each reared two litters and averaged 11.5 pigs born and 10 reared, which is six or seven pigs above national average.

Grading from the Wessex pigs (the majority of Felin pigs are Saddlebacks) is excellent. Two large commercial herds within five miles of Cardigan, both built entirely on Felin stock, are getting over 90 per cent grade A's. One of these herds scrapped its Large White boar in favor of a Felin Wessex sire to produce pure-bred baconers—and is now getting better results!

Mr. Hudson and his wife started at Felin Ban in 1948. Buying foundation stock from the best Wessex herds in the country, they built up 16 strains in the herd; culling on performance eventually reduced these to three.

Breeding Program

Highly selective line-breeding is practiced since Hudson believes that this is the only way to fix desirable qualities within the herd. When it is felt that the line-breeding is getting dan-

Reprinted from Pig Farming, Lloyd Chambers, Ipswich, Suffolk, England

gerously close new blood is introduced indirectly. Bringing in a boar from outside would put the breeding program back where it started, so a likely gilt is bought and put to the Felin stock boar. If the performance of the progeny suggest that the mating has nicked successfully, a boar out of the litter is retained for later use in the herd.

Farmers averaged 10.7 hours a work day in June last year. At the same time in 1956 the average was 10.9 hours per day, and in 1955 it was 11.2 hours. Much of the decrease in the farm workday comes about as a result of reductions in chore labor.

In-piggers get a maximum of 4 lbs. nuts daily until they come into farrow in roomy, permanent farrowing quarters. Mr. Hudson does not move them in too early as he believes that exercise is beneficial, and that docile sows should soon settle down.

Either Hudson or his wife sit up with sows farrowing at night. As Mrs. Hudson says, "If you are going to the trouble and expense of feeding and housing an in-pig sow for four months to get a litter, you might just as well spend the last four hours with her and round the job off properly."

Infra-red lamps are used in the creeps, but in summer sows and litters go outside as soon after farrowing as the weather permits.

California has more hired farm help than any other state.

Weaners average some 35-40 lbs. Hudson has no evidence that heavy weaners necessarily grade better than lighter ones. The important point is to produce a healthy, thriving pig and to avoid any check after weaning.

Stock boars stay inside, except for occasional runs with in-pig sows. Before feeding, each boar is made to enter the sty while the pigman tips the food into his trough—just in case! Any boar being trained for show, which gets nasty with its attendant, is put in with a bred sow which soon puts him in his place.

Two Hints

Here are two hints passed on by Mr. Hudson: when he rings a boar he wears different clothes from usual and does not speak, so that the boar will not associate pain with the smell or sound of his owner, and take his revenge later.

When rearing young boars for show or sale, always have a small hog in their pen for company and to provide a little competition at the trough to stimulate their appetite.

"You Make More Money With Continuous Corn"

Across the corn belt, farmers are getting corn every year on the same land — quitting their rotations. With yields going up, not down, here's what they say.

Condensed from Farm Journal

THERE'S no stopping the trend to continuous corn, agree most corn leaders. No other crop pays like corn, and farmers like the 100-bushel crops they haul in year after year.

What's more, many growers say that their yields with continuous corn are going up—not down.

For example, in Decatur County, Ind., the Heger Brothers have a field that's been in corn since 1951. It averaged 97 bushels an acre in 1954, 135 bushels in 1957.

In Fulton County, Ohio, Leon Nafziger's best 1957 corn — 102 bushels an acre — was a field that's been in corn 23 years out of the last 25.

Orson Hill, Ogle County, Ill., had fifth-year corn that turned off 100 bushels of No. 2 corn in 1957.

C. V. Conder, White County, Ind., had tenth-year corn that hit 181 bushels an acre last year.

And a field that's been in corn for 30 years straight is now averaging 100 bushels for Yens Have and Irving Knudson in Redwood County, Minn.

Most scientists agree that continuous corn is not only possible but *profitable* on land where erosion is not a serious problem. Even the skeptics are talking about more corn in the rotation —say four or five years out of six.

But farmers figure it's academic to speculate whether you can grow corn continuously for five years, ten years or forever. They aim to keep following corn with corn until they hit a snag. And so far, most growers have been able to get around the troubles that the scientists predicted they

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

would run into with continuous corn.

Does It Wreck the Soil?

Corn every year takes more fertilizer — especially nitrogen. The trick is to keep fertility up and the soil easy to work so you get the high yields needed to more than offset the cost of extra plant food. And that takes keen management.

Tests have shown that a good windbreak around the farmstead can reduce winter fuel bills as much as 22 per cent by diverting winds over and around the house.

Virgil Smith grows 200 acres of continuous corn in Kossuth County, Iowa. It's land that was growing 60-bushel corn when he bought it in 1946.

In 1957, those 200 acres—in corn for from five to eleven years straight—averaged 90 bushels an acre despite a spell of dry weather. In 1956, they averaged 115 bushels.

Smith puts on 400 pounds of 0-20-20 per acre every four years. Each year, he puts 200 pounds of 8-12-12 alongside the row when he plants, then side-dresses later with 250 pounds of anhydrous ammonia.

C. V. Conder, whose tenth-year corn made 181 bushels an acre, has tried a dozen different fertilizer combinations during the last 10 years.

The combination that looks best for Conder's high-fertility soil is 100 pounds of actual nitrogen and 100 pounds of actual potash (300 pounds every third year) plowed down in the fall. Then, at planting time, 100 pounds of 5-40-0 alongside the row and in June, 50 to 100 pounds of actual nitrogen as side-dressing.

Conder is convinced that he is improving his soil with continuous corn.

Years ago, the Panici Brothers bought a run down farm in Pulaski County, Ind. Neighbors told them that it wouldn't raise an umbrella!

"We were about ready to agree with that, too," recalls John Panici. But now practically the whole farm is in corn—some fields for seven years—and that was their best corn in 1957. Made about 110 bushels an acre. Of course, they've built up the land with fertilizer.

"The Panicis' yields are getting better every year," says Marshall Allman, with the Farm Clinic at Lafayette, Ind. "Their poorest corn last year was after sod."

Soil compaction is a hazard with continuous corn. Orson Hill, the Illinois farmer, avoids it by making only four or five trips over the field for a crop of corn.

That's possible with wheel-track planting right behind the plow. Weeds? Hill gets by with only two cultivations and a spraying with 2,4-D when the corn is three inches tall.

"It would be suicide to try and grow continuous corn any other way on my land," says Hill. He has a "problem" soil—a Durand silt loam with clay so close that he can't plow it deep.

Dean Wolf, a Farm Journal field editor, checked Hill's fields. Only trace of a hard plow-pan was in fields that had been minimum-tilled less than two years. "The other fields were like walking on a cushion," says Wolf.

Adds Hill: "I still plow in the same gear but I pull an extra bottom now — that's how much soil tilth has improved." Hill says he'll stick with continuous corn unless yields drop be low 80 bushels an acre. Except for a bad year, there's little chance of that.

The Heger Brothers in Indiana are having plow-pan trouble after seven years of corn-after-corn. Yields are still climbing, so the pan isn't too serious. But it's there. Here's their plan. After about 10 years of corn, they'll put in a crop of sorghum so they can get in during early fall with a subsoiler.

Another way to avoid plow-pan problems is not to plow. That's the nub of the system used by George Scarseth on a farm north of Lafayette, Ind. He plows only once every six years when he puts on lime.

Other years, he puts in the crop with a Till-Planter, a machine that works up a seedbed, puts down fertilizer and plants corn—all in one operation. Two sprayings with 2,4-D and one cultivation keep down the weeds.

Man is the only animal that works himself to death to get money so he won't have to work so hard.

"I'm pretty well married to this system," says Scarseth. And well he might be. His seven-year average, on land that squeaked out a 25-bushel crop in 1950, is 90 bushels an acre. In 1957, his corn averaged 140 bushels, and a 5-acre plot made an official 172 bushels.

"The most net profit per acre over the long pull is what I'm after," says Scarseth. "I'm looking for the cheapest way to grow a bushel of corn while improving and conserving the soil."

Scarseth figures he has to get more than 70 bushels an acre to make any money. At first, he spent up to $46 an acre for plant food, now averages about $33. But he's made—and is making—money.

Still another way to keep good soil structure with rigid corn cropping is to use lots of manure. A farmer who really hitches manure to continuous corn is Yens Have, the Minnesota grower. He spreads 15 loads to the acre, and supplements that with bagged plant food.

Extra manure also gives added punch to the 25-acre field of continuous corn on Loren Nafziger's farm in Ohio. The manure, plus 60 pounds of actual nitrogen, grew 102-bushel corn in 1957.

How to Handle the Stalks

With continuous corn, last year's stalks supply organic matter for the soil and nitrogen for next year's crop. Growers have figured out various ways to get the big tonnage back into the soil.

Virgil Smith plows deep with an IHC Model 150 disk plow right after picking. Instead of turning under the 18,000 stalks on each acre, the plow distributes them through the 12- to 14-inch plow zone.

Smith doesn't chop or disk the stalks; likes to have them and the roots sticking up to trap winter snows.

In Illinois, Orson Hill prefers to leave the stalks standing all winter. In the spring, he hits 'em once "kitty corner" with a heavy disk about three weeks before plowing. "Even then, you need a heavy-duty, high-clearance plow," says Hill.

In Minnesota, Yens Have equips a regular plow with a wheel attachment that rolls the stalks into the furrow. Like a windrow turner for hay or oats.

What About Soil Pests?

Not all, but some year-after-year corn growers have run into serious soil pest problems.

Rootworms hit Orson Hill's crop hard before he started spraying 1½ pounds of heptachlor per acre while he disks, ahead of plowing.

Conder uses ½-pound of aldrin per acre in the starter fertilizer, with a heavier disked-in application every two or three years.

Why Add to the Surpluses?

Some people see red, white and blue flashes when you talk continuous corn. "We'll never whip the surplus that way," they fume.

They're right. But we aren't whipping it with controls, either.

Scarseth sees continuous corn —with big yields to reduce the cost of growing each bushel—as the last big chance that Corn Belters have to keep their favorite crop.

"The Corn Belt farmer has soil and climate in his favor. With that he can add the latest scientific methods to produce corn for less cost than anywhere else," concludes Scarseth.

How To Increase Net Profit In 1958

"The average farmer, who wants to and will work at it, can increase his net income by 25% in 1958," economists say . . .

Condensed from Massey-Ferguson Farm Profit

COSTS will remain high and farm prices only so-so this year, so what you do on your own farm with your own tools and opportunities is going to be much more important than what happens in Washington.

Getting that extra net income will come mostly by doing what you're doing now—but doing it a little better and on time. Maybe it's adding more fertilizer, or keeping a field in corn an extra year. Maybe it is building a farrowing crate or installing heat lamps to save those extra pigs. Or perhaps it is getting rid of your "boarder" cows.

One thing sure: If you plan to farm exactly the same in 1958 as you did in 1957, then you're out of date. You must improve each year to keep up with the pace of today's agriculture. From farm records—actual experiences of successful farmers—we have assembled these six ways to increase your net income in 1958. Why not give those that fit your farm a try?

1. Boost Your Volume

Purdue University records on southern Indiana farms showed a net income of $2,674 on a gross of $10,075. But net jumped to $4,306 when gross moved up to $14,562. Boosting gross 44% increased net 60%. A bigger gross on your farm can mean even higher net.

Here are ways to increase your volume, without adding an acre:

A dairyman can add 3 to 5 cows to his milking string—and $1000 to $2000 to his gross, without adding much more work. Each extra sow can boost your gross by $300. Each extra steer can add $100. A hundred extra layers can gross $600.

Most farmers can grow more crops on the same acres. For example: A 10-bu. higher corn yield on 75 acres can gross you an extra $1000—and boost net by $750. Five bushels more soybeans on 50 acres means another $600.

2. Go for High Value

Ask yourself: How can I use

Reprinted by permission from Massey-Ferguson Farm Profit, 1000 Empire Bldg., Milwaukee 3

my acres, dollars and labor to return the most money? Take acres: An acre of corn will bring you more money than an acre of oats, so take a hard look at your rotation.

An hour's work will buy 50 per cent more butter in 1958 than it bought in 1940.

Can you grow corn 3 or more years in the same field? George Scarseth took a piece of worn out, 30-bu. corn land north of Lafayette, Ind., 7 years ago and has planted it to continuous corn. Seventh year yield: 173 bu.

Try a specialty crop if you have a market.

Spend your dollars for most return. Example: If you have only so much money for fertilizer, apply it to the crop where it will pay the most return. Purdue records show the first 40 lbs. of nitrogen fertilizer on corn returned $4.04 profit per $1 spent. The next 40 lbs. returned $2.55; next 40 lbs., $1.49.

3. Watch Your Market

Indiana hog farmers have made an extra $13,000,000 in the past 8 years by avoiding market peaks—they timed their pigs to sell at peak prices.

An Iowa hog farmer can boost his hog check $100 by telephoning several markets to find the highest price. Our check shows prices vary as much as $1.45 in a farmer's marketing area.

Cattle feeders who watch the day of the week they sell are better off than those who follow the habit of selling on Monday when 45% of the week's cattle hit the market.

Cows freshening in the fall will make dairymen $1,500 extra on a 30-cow herd.

The poultryman who has good eggs will make more on a graded market.

In general, it's good advice for crop farmers to avoid selling nonperishable crops at harvest time. Store your grain and hold for higher prices.

4. Jump Crop Yields

Raise your yields and cut your costs per bushel. University of Missouri figures show how important it is to get high yields if you want maximum profits. It costs 84c a bu. to grow a 35-bu. yield of corn, so profit is only 41c on $1.25 corn. A 45-bu. yield lowers cost to 76c, boosts profit to 49c. But an 80-bu. yield drops cost to 58c, and increases profit to 67c. Your per acre net income is 243% more on an 80-bu. yield than on 45-bu.

The same holds true of cotton, hay, tobacco, soybeans, wheat and other crops. Plant and fertilize for maximum yields, if you really want profit: 100-bu. corn; 50-bu. soybeans; 50-

bu. wheat; high producing pasture.

Spray if economically practical for control of weeds and insects. Do the job well, on time, and with a b r e a k from the weatherman, you can harvest a record crop—and boost your profits.

5. Boost Livestock Efficiency

Boiled down, this means turning out more meat, milk, and poultry on less feed. A hog man should set a goal of at least 8 pigs weaned, making 200 lbs. in 5½ months, on a total of 650 lbs. of feed.

The cattle feeder should know first where his cattle came from —it's the only way he can know what to expect in the feed lot. Many look-alike steers will vary in gain as much as 1 lb. daily. Use all the roughage you can—it's usually cheaper than grain. Feeds vary in price, do some figuring on corn vs. sorghum, on corn vs. ear corn; on relative value of protein.

The dairyman's first step to profit is to eliminate every cow that isn't giving 6,000 lbs. of milk. One good cow producing 10,000 lbs. of milk will make you more income than 6 cows at 6,000 lbs.

Your hens should lay 200 eggs a year. Get in, or get out of poultry.

6. Make Your Labor Count

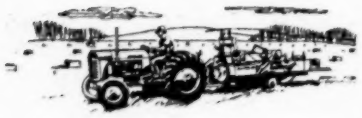
One of the most important keys to profit is how much production you have per man. It doesn't mean a thing that you work hard. It is more important that you make your labor pay off.

For example, a man can never work as cheaply as a machine. So let modern tractors and labor saving machinery do your work. You do what the machines can never do—think! Use big machines. Double up, save trips through the field.

If e v e r y person in the United States will drink just two ounces more milk per day there will be a shortage instead of a surplus of milk, says an extension dairyman. This would mean the farmer's income would be increased and the government's expenditures for farm price supports would be lessened.

As Tillman Bubenzer, manager, C o n n e r Prairie Farm, Noblesville, Ind., says: "There are $10-an-hour jobs and jobs that pay only 20c an hour." His list of 20c-an-hour jobs include: cultivating corn 3 times; loading manure with a pitchfork; cutting hay when it's in full bloom. His $10-an-hour jobs include: ear notching gilts; building good farrowing crates; adjusting combine properly; renovating old pasture.

Farm Custom Rates for 1958



Hiring, doing or exchanging work with your neighbors offers opportunities for cutting costs in 1958 . .

Condensed from Iowa Farm Science

Ray E. Armstrong, Agricultural Engineer

CUSTOM work offers two distinct possibilities for cutting machinery costs in 1958. Whether you can or should take advantage of one or both depends to some extent on the size of your farm, the machinery you have and the time or labor you have available. One possibility is to perform custom work for others with some of your machinery. The other is to use the services of a neighbor offering to do custom operations.

Experiment Station studies have shown that some farms have more machine capacity than can be fully used on the farm where located. In this case, using some of this capacity in *doing* custom work for neighbors permits you to make fuller use of a machine and to earn a return on this use.

Other farms meanwhile lack one or more particular pieces of equipment to do a given job most efficiently, and the operator may not want to invest in a machine to do this particular job—especially if it cannot be used very much or also for other purposes. The opportunity here is that of *hiring* custom work to get the job done without a substantial machinery investment.

Some operators may find it advantageous to follow up both opportunities—hiring some types of custom work on his own farm and, at the same time, offering some custom services to his neighbors.

Custom Work . . .

Supply and demand for custom services and machinery set the effective going rate — the combination of the number of operators willing to do custom work and the number of operators seeking custom services. The information in this article is intended only as a guide in determining the rates to charge or the rates you can expect to pay for custom services.

Certain types of equipment are not used enough in some areas for a "going rate" to be set by supply and demand. And, often, a transaction is between parties

Reprinted from Iowa Farm Science, Iowa State College, Ames, Iowa

not wishing to bargain for "all they can get." Or, an exchange of services between the parties may be involved. Individual local conditions must be considered in using and adjusting the rates given in the 1958 custom rate guide.

The Iowa State College Farm Services Department has the responsibility for a considerable amount of farming operations and services of field tillage and crop harvesting for other departments of the college. This provides the opportunity to study the costs of certain farm operations. It is from this experience and background, plus cooperation of people working in the field of farm management and costs supplied to us from colleges and universities in adjoining states, that we develop the suggested custom charges and rates. Most of the services performed by the Farm Services Department are, in fact, handled on a custom basis, with the costs charged back to the departments for which the work is done.

At the beginning of each year, we prepare an adjusted schedule of service rates. Each charge is determined by anticipating increases or decreases based on several years' records. *Labor* costs are carried as a separate item in our rates and, thus are NOT included in the custom rate guide.

The guide rates are based on the approximate unit cost of work done under normal conditions and are generally applicable to most Iowa conditions. For highly favorable conditions — large fields, long rows, etc. —the rate should be less than suggested in the guide. For unfavorable conditions — small or irregular fields, poor soil conditions, etc.— the rates should be adjusted upward. Labor charges have been omitted because these vary with local conditions and among different parts of the state.

How to Use Guide . . .

Suggested charges and rates in the guide apply to normal working conditions. Remember that it is only a guide and that the actual "going rate" locally may be above or below that listed.

The cost of owning and operating farm power units and machinery may be divided into two separate cost items—cost of ownership and cost of operation. Both are taken into consideration in the rates suggested in the guide.

Cost of ownership represents a fixed cost, including costs of (1) depreciation, (2) interest and investment, (3) taxes and insurance and (4) housing.

Cost of operation or the actual out-of-pocket cost for operating a tractor or machine is a variable cost and is directly dependent on amount of use, including (1) fuel or power cost, (2) repair, (3) lubrication, etc.

IOWA FARM CUSTOM RATE GUIDE — 1958

Farm operation	Suggested charge under normal conditions (Labor NOT included) Per hour	Per acre
TILLAGE:		
Plowing, 2-bottom	$2.50	$2.75
Plowing, 3-bottom	3.00	2.50
Disk harrow, 15-foot single	2.00	0.50
Disk harrow, 10-foot tandem	2.50	0.80
Disk harrow, 14-foot tandem	3.00	0.70
Spike-tooth harrow, 22-foot	1.80	0.25
Spring-tooth harrow, 17 foot	2.00	0.65
Packing, double-gang corrugated roller	2.00	0.65
PLANTING:		
Drill, small-grain, 11-foot	3.00	0.80
Drill, small-grain, 11-foot, with fertilizer attachment and grass seeder	4.25	1.10
Endgate seeder	1.25	0.30
Packer seeder	2.50	0.65
Plant corn, drill, 2-row	1.50	1.00
Plant corn, drill, 4-row	3.00	0.90
Plant corn, check, with fertilizer, 2-row	1.75	1.20
Plant corn, check, with fertilizer, 4-row	4.00	1.00
CULTIVATION:		
Rotary hoe or weeder, 2-row	1.80	0.50
Rotary hoe or weeder, 4-row	2.50	0.40
Cultivate, 2-row	1.75	0.85
Cultivate, 4-row	3.00	0.70
Cultivate and fertilize, 2-row	2.00	1.05
Cultivate and fertilize, 4-row	3.25	0.90
HARVESTING:		
Corn picking, 2-row	6.50	3.25
Combining, direct or pick-up	7.00	3.50
Corn combining	8.00	4.00
Windrowing	2.50	0.85
Forage harvesting, corn and sorghum	6.00	6.00
Forage harvesting, grass and legume	5.00	5.00
HAYING:		
Mowing or pasture clipping	2.25	0.75
Raking, side delivery	2.50	0.80
Baling, field pickup	0.11 a bale	....
Field Chopping	6.00	....

FERTILIZING:		
Spread commercial fertilizer, broadcast	2.25	
Tractor and manure loader	2.00	
SPRAYING:		
Sprayer, tractor with attached or trailer-type boom	1.30	
Sprayer, high-clearance, self-propelled	1.00	
MISCELLANEOUS:		
Mowing roadsides	2.50	
Cut cornstalks, 2-row, rotary-type	2.50	1.20
Bore post holes	2.00	
Saw wood, chain saw	2.50	
Tractor only, 2-plow	1.25	
Tractor only, 3-plow	1.50	
Tractor only, 4-plow	1.75	
Shell corn	2½c bu.	
Dry shelled corn or small grain	1c a bu. per per cent of moisture removed; 5c minimum charge per bushel	

Fertilizer Cheapest Feed

The cheapest feed a dairy or beef farmer can buy is fertilizer—applied to his grass. This has been demonstrated consistently in fertilizer trials made in 1956 and 1957 on farmers' fields in various parts of Pennsylvania.

Early spring applications of 100 pounds of nitrogen per acre at a cost of $12 doubled the dry matter yield of three commonly grown grasses. The yield of bluegrass increased from 0.8 to 1.7 tons per acre, orchardgrass from 1.1 to 2.2 tons per acre, and timothy from 1.4 to 2.8 tons per acre. The nitrogen-fertilized grass also was more valuable as feed because of the increased protein content.

"Nitrogen cannot do the job alone," declares Lawrence F. Marriott, soil technologist at Pennsylvania State University. He points to the need for a well-balanced fertilizer program.

"The importance of potash in fertilizer was shown by decreases of 18 per cent in yield of bluegrass and of 33 per cent in yield of orchardgrass when potash was not applied," Dr. Marriott states.

Omission of phosphate had less effect. The greatest reduction in yield attributed to a lack of phosphorus was 11 per cent for timothy. —*Pennsylvania State University*

You Can Do Farm Arc Welding

No farm shop is complete unless it is equipped to handle simple repair work on metal . . .

Condensed from Electricity On The Farm

C. L. Lawton

HOW would you repair a broken drawbar?

Or, for that matter, how would you join any two pieces of steel? How do you extend the life parts that wear out, such as plows and sprockets? How do you bend metal? Or cut it?

Any of these jobs are pretty tough without a welder, but a "snap" with one.

The need to cut expenses has caused many farmers to turn to welding as a method of reducing repair bills and saving valuable time spent on trips to town. With welding, they can repair almost any broken metal part, hardsurface parts which wear out to make them last longer, and build special time and labor saving equipment to help them with their farm work. With welding equipment, a farmer also easily cuts and bends metal by heating it.

What is arc welding?

As it's name implies, the heart of the process is an electric arc. The arc plays between the work and a metal electrode that is clamped in a holder, which the operator holds in his hand. Cables run from the work and the electrode holder to the welding machine which supplies and controls welding current and heat of the arc.

Learning to weld is easy. Many welding equipment dealers and vocational agricultural departments of local high schools conduct short courses on arc welding during evening classes. These courses are very helpful, but not absolutely necessary. A good share of farmers with welders learn to use them simply by practicing.

Little equipment is required for arc welding. You need a welding machine and cables to carry current from the machine to the work with an electrode holder on the end of one cable and a ground clamp on the other. A face shield with dark lenses prevents "sunburn" of the face

Reprinted by permission from Electricity on The Farm, 305 East 45th Street, New York 17

while permitting the operator to watch the arc. Gauntlet-type gloves and rolled-down sleeves are recommended to prevent arm "sunburn." A supply of consumable electrodes for welding and an arc torch for heating, soldering, brazing round out the needs.

The primary cause of juvenile delinquency seems to be heredity.

Types of Welders

There are two types of electric welders available for use on rural power lines. The AC output units are well established and capable of handling all routine farm welding. Recently, combination AC and DC welders have become available. They will do the same work as the AC machines, and also have DC which is preferred for lighter gauge work and for most metals other than mild steel. The AC/DC welders are transformer welders with rectifiers which change AC to DC.

Some portable engine-driven welders are also power generators that are used to operate power tools or lights on repair jobs. These welders are also used as stand-by emergency power generators which are employed during power failures.

Most farm welders are 180 ampere size. This means they have a maximum output of 180 amperes, sufficient to handle all routine farm welding. They meet the requirements of rural power lines. They are frequently called "limited input" machines to describe the fact that they draw less than 37.5 amperes input current.

Farm welders are r u g g e d equipment. There is very little that can possibly go wrong with them. The only principal requirement for maintenance is to keep them in a well-ventilated location and periodically remove the case and blow the dust out of the inside of the machine.

3½ barrels of Great Salt Lake water will make 1 barrel of salt, when evaporated.

Your Electrode Stock

You don't need a large stock of the consumable metal electrodes, but you should have several different types handy to do any job that might come along. A general purpose mild steel electrode (E-6011) will do most repair work. A second mild steel electrode (E-6013) should be available for welding sheet metal. T h r e e different hardsurfacing electrodes will meet the requirements of most farms — one for metal-to-metal wear, another for metal used in sandy soil, and the

third for metal used in rocky soil.

To completely round out your electrode stock, a few sticks of cast iron, stainless steel, and nonferrous electrodes are recommended. Store electrodes in a good, dry spot; be sure to identify them so you don't accidentally use a cast iron electrode on mild steel. The cost of electrodes is practically negligible. For example, you can hardsurface the cutting edge and point of a plow with two electrodes worth about fifteen cents total.

Long an industrial tool, welding is as important to metalworking as a hammer and saw are to woodworking—and there's a lot of metal on the modern farm.

Failure to Topdress Limits Alfalfa Yields

Failure to topdress is one of the major factors in limiting alfalfa yields in Virginia, says John F. Shoulders, Virginia pasture specialist.

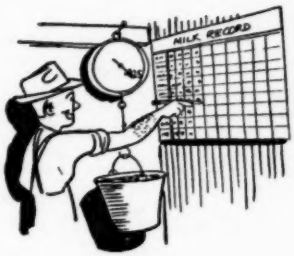
For the last several years, alfalfa yields have run around two tons per acre. Controlled tests and experience in the field have shown that yields of 3½ to 4½ tons per acre are by no means unusual under good management.

Shoulders says many farmers will follow good cultural practice, including proper fertilization, when they are seeding alfalfa, only to omit topdressing.

Each ton of alfalfa hay harvested removed about 45 pounds of nitrogen, 12 pounds of phosphorus and 45 pounds of potash from the soil. Properly inoculated alfalfa fixes its nitrogen from the air. Phosphorus and potash, however, must be supplied. Boron should also be applied. Alfalfa fertilizers bought contain enough of the latter nutrient.

Topdress each year with from 600 to 1,000 pounds per acre of a 0-10-20 borated, 0-14-14 borated, or the equivalent in other analysis fertilizer. The fertilizer may be applied during the dormant season, or after the first cutting if applied before growth begins. Severe burning will result if the fertilizer is applied after the new growth has started. *—VPI Newsletter*

How Much Grain for Dairy Cows?



Old rule of thumb says 1 pound of grain for each 5 pounds of milk, but some cows are over fed while others don't get enough.

New Mexico Extension News

SCORES OF dairymen are losing money because they feed entirely too much grain to low-producers and not enough to cows giving large quantities of milk.

The greatest loss probably comes from overfeeding cows in the lower producing brackets, says E. E. Anderson, extension dairyman. However, many individuals in many herds never reach the production of which they are capable simply because they don't get enough grain.

It's time to look at feeding programs as did B. J. Romig, purebred Holstein dairyman, near Las Cruces, New Mexico. He knew he had high production bred into his herd, but he was failing to get the amount of milk of which he felt sure his herd was capable. At that time, he was feeding all the high-quality alfalfa and silage his cows would eat and concentrates at the rate of 1 pound grain to 5 pounds milk.

He changed to a system of feeding grain so that each cow was getting the amount actually needed above that supplied by the roughage. In so doing, the lower producers were fed less grain and the higher producers got more. Official DHIA figures showed that he upped his herd average from 11,684 pounds of milk to 13,000 and butterfat from 396 pounds to 449 pounds per cow.

By changing from the old rule of thumb—1 pound of grain to 5 pounds of milk—to a system of feeding according to each cow's needs, he raised the herd average by 1316 pounds of milk containing 53 more pounds butterfat. And, he fed only a very little more grain, Anderson says. What he actually did was to take some

Reprinted from New Mexico Extension News, published by the Agricultural Extension Service of New Mexico A & M, State College, New Mexico

of the grain away from the lower producers and give it to the higher producers.

When grain provides feed nutrients at no greater cost than hay or other roughages, the only concern is to see that every cow gets enough of the grain ration. This price relationship existed a few months ago. Normally, roughages supply feed nutrients much more cheaply than grains. Under such circumstances, each cow's grain allowance should be based on the amount of milk she produces beyond the amount she can make from the roughage she is getting, recommends Anderson.

To illustrate, a normal-sized, mature Holstein cow can eat enough good-quality alfalfa hay, or silage and alfalfa hay to maintain her body and produce at least 24 pounds of milk. Such a cow needs only enough grain mixture for the milk she produces over the 24 pounds. Cows giving low-test milk require four-tenths of a pound of good grain mixture for each pound of milk produced.

Suppose a cow is giving 30 pounds daily. Such a cow would need grain for only 6 pounds of milk, or the difference between 24 and 30. The 6 pounds multiplied by four-tenths would be 2.4 pounds of grain mixture or the amount she would need daily. Now suppose such a cow was being fed by the "thumb rule." Under this system, she would get 30 divided by 5, or 6 pounds of grain mixture. Such a cow would be grossly overfed says Anderson.

Now calculate the needs of the cow giving 70 pounds of milk daily. Using the "thumb rule" and dividing 70 by 5, she would be fed 14 pounds of grain mixture. But by feeding according to her actual needs, she would get 18.4 pounds of grain mixture daily. This is arrived at by subtracting 24 from 70 and multiplying the difference (46 pounds) by four-tenths. Thus, it is evident that the high-producing cow is very much underfed by the 1 to 5 method. That is why many highly-bred herds fail to produce as much milk as they are capable of.

Like any system of grain feeding, it may be necessary to vary the plan to fit the needs of certain individual cows in a herd. For instance, a good dairyman never feeds high-producing cows more grain than they can safely handle. If a cow fails to hold up in body weight, or milk flow, puts on too much flesh, or does not respond as expected, change the rate of feeding to fit her needs. It takes a lot of good cow sense, in addition to a practical feeding system, Anderson concludes, to get the most for each feed dollar spent.

Progress Report On New Creeping Alfalfa

It's coming . . . a new spreading alfalfa that may be ideal for pastures and marginal growing areas . . .

Condensed from Crops & Soils

H. O. Graumann, U.S.D.A. Research Agronomist

TODAY there is need for truly superior creeping, pasture-type alfalfas on several hundred million acres of grassland and abandoned cropland in the Plains region and West, and pasture lands of the East. Such alfalfas would help to alleviate serious nitrogen deficiencies of grasslands, and increase both the yield and protein content of the forage produced.

Creeping alfalfas were introduced into the United States early in the twentieth century; and their spreading character was thoroughly described more than 40 years ago. However, because of low yielding capacity, they received little more than passing attention for many years.

Following the severe drouth of the mid-1930's the need was recognized for legumes suitable for use with grass in depleted rangelands.

Present Status

Three varieties of spreading alfalfa have been developed for, and released to, American agriculture, namely Nomad, Rhizoma, and Rambler. Limited quantities of seed are available for Nomad and Rhizoma, both of which spread by the rhizomatous character. Rambler, a creeping-rooted type developed in Canada, is not yet available for farm plantings. Moreover, testing work on this recently released Canadian variety has not progressed sufficiently to appraise its performance potential in the United States.

None of these varieties have resistance to the important alfalfa diseases and insects.

Nature of Spread

For an alfalfa plant to be considered truly creeping or spreading it should have inherent capacity of extending its area of ground cover through produc-

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tion of new plants by two vegetative means, namely, (1) the development of *underground stems* from which new roots originate, thus resulting in new plants —commonly referred to as rhizomatous type of spread, and (2) the production of *lateral roots* which give rise to new crowns known as creeping-rooted alfalfa. So far as is presently known, rhizomatous spread and creeping-rootedness are distinct one from another.

Breed cows for fall freshening, when milk prices are usually highest. A cow gives about 50 per cent of her lactation during the first four months after freshening.

While environmental influences on expression of the spreading habit are not fully understood, it is known that given stocks possessing this trait behave differently under different environments. Even under the most ideal conditions there is little or no evidence of spreading within the first year following planting. Thin stands are known to be most conducive for full expression of the spreading habit, whether it be of the rhizomatous or creeping-rooted type.

Existing varieties and stocks possessing the creeping character vary considerably in their inherent ability to spread, ranging from less than 25 per cent of the plants in weak creepers which show spread to more than 75 per cent for the strong spreaders. Inasmuch as stocks possessing the spreading habit are generally less productive than hay types, and usually do not show new plant development under conditions of thick stands, the creeping character may prove of limited value for strictly hay-type varieties, particularly those with inherent superior stand persistance qualities.

Its Value

Spreading alfalfas probably will be of greatest value in pasture programs. Because of the deep-set crowns and relatively slow recovery rate which characterize existing varieties and breeding stocks, they appear superior to improved hay-type varieties in persistance to grazing. However, the superior hay-type varieties should prove extremely valuable in breeding programs designed to develop disease and insect-resistant creeping alfalfas.

An outstanding advantage of alfalfas with vegetative spread is their ability to withstand depredations of pocket gophers and other burrowing rodents. While highly susceptible to injury by rodents, these alfalfas are capable of self-renovation by developing new plants to replace those destroyed.

Occasional observations have shown creeping-rooted stocks to have a valuable capacity to recuperate following winter injury. This is particularly true where killing effect of low temperatures is confined to plant tissue located in the upper several inches of soil. Latent stem buds in the swellings of lateral roots far enough below surface to escape winter injury become active in spring and give rise to new plants, thus quickly filling in vacant spaces left by plant crowns killed.

It should be emphasized that in soils heavily infested with the organisms which cause highly destructive root and crown diseases, the recuperative value of latent stem buds may be somewhat decreased and possibly completely lost because of disease effects.

Certain of the spreading types, once established, have shown excellent survival under conditions of low annual precipitation. This survival value appears attributable to the plants' ability to stop growth or to go dormant during periods of moisture stress, and to resume growth when soil moisture again becomes available.

To date there is no clear-cut evidence of rhizomatous or creeping-rooted stocks having either appreciably lower water requirement or greater absorptive power for soil water under stress from drouth than the hay-type alfalfas.

Diseases and Insects

Since long-time stands are essential to most efficient use of alfalfa for pasture, the value of disease resistance becomes of paramount importance. It is recognized, however, that such need may vary with the area where, and the conditions under which, a given creeping alfalfa is to be used.

Turkey prices the first half of 1958 will be dominated by the large storage stocks now on hand, says an extension poultry marketing specialist. After late summer of 1958 prices will reflect next year's output.

For use in irrigated pastures throughout the country, and under many situations in the eastern half of the United States, particularly the Corn Belt region, resistance to bacterial wilt is important if stands are to persist and continue economically productive for more than 2 to 3 years.

Stem nematode resistance is of extreme importance in many irrigated areas of the west. Stand persistance, vigor of plants, and quality of forage can be materially enhanced by resistance to stem and leaf diseases, particu-

larly in areas with predominantly high precipitation and humidity.

The mushrooming spread of the relatively new and extremely destructive spotted alfalfa aphid, which in 1956 occurred in 30 states and caused estimated damage in excess of $40,000,000 should alert everyone to the urgency of incorporating resistance to this pest in both spreading and non-spreading alfalfas still in the making.

The U.S.D.A. reports that not a single case of the swine disease, vesicular exanthema, has been found in this country for more than a year. Less than six years ago, the disease was at epidemic proportions, with 42 states reporting infected swine herds.

Plant breeders are fortunate in having available suitable sources of resistance to bacterial wilt, stem nematode and the spotted alfalfa aphid. Resistance to these organisms can be transferred successfully into alfalfas being designed especially for pasture.

Plant breeders at scattered locations have intercrossed superior creeping-rooted and rhizomatous stocks with disease and insect resistant hay types. These crosses are being subjected to various breeding procedures, each directed toward the development of a spreading alfalfa superior for, and especially adapted to, the soil and climatic conditions, and the farm and ranch needs of the area. While breeding and appraisal work is a painstaking and unavoidably slow, it is the desire of plant breeders to develop and release as early as possible disease and insect resistant, strongly-creeping, persistant pasture-types of alfalfa which have high yielding capacity of good quality forage when grown in association with range and pasture grasses and utilized by grazing.

The creeping alfalfas, like the hay types, are best adapted to deep, fertile, non-acid, well-drained soils. Where limestone and mineral fertilizers are required for alfalfa, it is important that they be applied in accordance with needs before planting. After establishment, annual applications of phosphorus and potassium, and possibly trace elements, may be essential to fulfill the optimum maintenance needs of the alfalfa.

Local experiment station recommendations regarding both replanting and maintenance soil treatment needs, adapted varieties, and grazing management will serve as important guides in successful establishment and satisfactory longtime performance of creeping alfalfas.

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Miracle Rock: LIME

Here's what lime can do and can't do for your land . . .

Condensed from The Tennessee Farmer

Julius S. Hurst

IF I told you I would give you $6.00 for $1.00, everyone in his right mind would jump at the proposition. "A man would be crazy to pass up such a good deal," you'd say.

But that is exactly the proposition lime makes to those farmers who will use it wisely. When lime is applied in the correct amounts, and in the right way, crops can be expected to increase yields until we get back $6.00 for each $1.00 spent for the lime. And this is not hearsay. It has been proven time and time again. And the proof comes from scientists who test lime, and from farmers who use lime wisely, and not from people who make and sell lime.

Lime is a rock crushed into a granular powder. One of its main parts is calcium. Another part is magnesium. And sometimes a lesser part may be phosphorous, if the material used is slag. Most soils in the United States east of the Mississippi River need lime. And some land needs it badly.

We can go to the barn, shell a quart of corn, add buttermilk, baking powder, salt and lard, put it into the oven and bake; but we would not have cornbread. But if we first grind the corn, then add the milk, baking powder, salt and lard, and bake, we have delicious southern cornbread. All we did was to grind the corn so the meal could get out of its cover.

Many of our soils are like grains of corn. They have natural fertilizer elements in them, but these fertilizers are locked in the grains of soil. Lime working in soil frees these natural fertilizers.

Lime will also make commercial fertilizers do a better job by keeping the soil particles unlocked, and preventing the fertilizers from joining soil chemicals which rob plants of needed plant food.

We all know plants will not grow on a concrete road. It is

Reprinted by permission from The Tennessee Farmer, 1529 Demonbreun, Nashville, Tennessee

too packy. We also know that plants seem to do best when the soil is loose and granular in texture.

Many overcropped soils are packy, and the soil grains are stuck tight together making it hard for roots to grow and take in plant food.

A lot of body energy is used in seeing. Read continuously for eight hours and you use as much energy as in marching 33 miles.

Lime has the peculiar power to cause land to become granular in texture, thus making it possible for plant roots to grow fast through the soil, to grow deep down, to get more water and plant food, and in general do a near miracle job in producing better crops.

Do you know what causes goiter, that large knot on the neck? People who do not get a tiny amount of iodine may have goiter. Medical science tells us that a very tiny amount of iodine will do wonders for our body by keeping it healthy. That is why we use iodized salt, because the very, very small amount of iodine in it prevents goiter.

Plants are like humans sometimes. They need very small amounts of certain things if they are to remain healthy. Calcium and magnesium are things most plants need in small amounts if they are to remain healthy and produce good seeds and foliage.

Lime is the answer to this problem. It contains both calcium and magnesium and it supplies them for five to six years when properly applied.

Tests show that a soil completely without calcium and magnesium produces very poor plants. Yet after adding a very small amount of calcium and magnesium this same soil shows greatly increased results.

So lime in small a m o u n t s where needed can increase production a great deal because of the calcium and magnesium it supplies.

Nearly everybody has seen some kind of snake pickled in alcohol or weak acid. Nothing lives or does well in acids. Since many Tennessee soils are strongly acid, crops cannot do well in them.

Lime has the power to make acid in the soil into a neutral substance. This makes it possible for millions of tiny soil bacteria to grow and improve the soil. Some of these bacteria gather nitrogen from the air. Others cause dead roots, stems and leaves to decay quickly and enrich the land.

In strongly acid soils, plant leaves and stems will not decay, or they decay very slowly. Since

decaying is speeded up by the working of tiny bacteria, the only way they can grow is to neutralize the soil. Lime in proper amounts, and applied in the right way can make the acid in soils neutral. This changes the soil into a fine home for helpful bacteria—a tiny but very important soil builder.

Yes, lime is valuable to land in five important ways. (1) It unlocks natural fertilizers in soil grains. (2) It conditions the soil so the fertilizer we add can be used more quickly and completely. (3) It improves the packy texture of the soil where roots can grow better. (4) It adds much needed calcium and magnesium which must be present in small amounts to have healthy plants. (5) And last, it encourages the growth of tiny soil bacteria which must be present if we have healthy, productive soil.

There is a right way and a wrong way to do most everything, and using lime is no exception. There are several mistakes we can make in using lime which is disappointing and which makes us think lime is not doing what it is supposed to do.

Lime Will Not Replace Fertilizer

All plants must have nitrogen, phosphorous, and potassium to grow properly. And lime does not contain these elements to any degree. So if we want worn-out land to grow crops we must first apply the plant food in the form of a complete fertilizer. Then we must add lime in the right amount and in the right way. With proper soil preparation we can expect a reasonably good yield.

Federal regulations now say that only the dust form of methoxychlor, not the spray, can be used to kill hornflies on dairy cattle. Rub lightly on neck, back and upper sides one heaping tablespoon of 50 per cent wettable powder per animal not oftener than every three weeks.

Lime Will Not Work Overnight

Nitrate fertilizer is probably best known because it seems to work overnight. The reason is that nitrate fertilizer is very soluble. But lime is a crushed rock, which may have been a rock for ten thousand years. So we cannot expect it to start dissolving the night it covers the ground. It takes time, but it lasts a long time, possibly five or six years.

Lime Will Not Do As Well On Top of the Soil

What kind of biscuits could we expect if we make the dough with flour and milk, then sprinkled the soda and salt on top. They would be flat and tasteless.

Why? Because we failed to mix the ingredients properly. This same principle is true of lime. If we fail to mix the lime properly with the soil we must wait longer for results. And lime properly mixed with soil will do a much better job quicker.

On permanent pasture we must spread it over the field, since we may not care to disturb the sod. But since the land is covered with grass it does not take it long to settle down under the fallen leaves and stems and mix with the soil.

Lime Will Not Make It Rain

Nothing does as well during a drouth as it does in a normal season. Lime will not replace moisture. It will not make cool summer nights warm, and it will not make the sun shine. In other words lime will not make a good season out of a poor one. And to blame lime for a poor job during a poor growing season is wrong.

Lime is a Miracle Rock But it Will Not Do Everything

Lime is truly a miracle product, but just any amount will not be right. Too much is too much. Too little is too little. And just right is just right. Each type of soil has so much acid, and the right amount of lime is that amount which will bring the acid in the soil up to the neutral point. A soil test is the only way we can be sure of the r i g h t amount.

Now, putting all this knowledge into practice, you might ask, "Can I expect lime to return $6.00 for each $1.00 spent for it?" The answer—yes, we can be reasonably sure lime will work miracles for us if we use the right amount in the right way.

Low Hog Prices Due in '59-'60

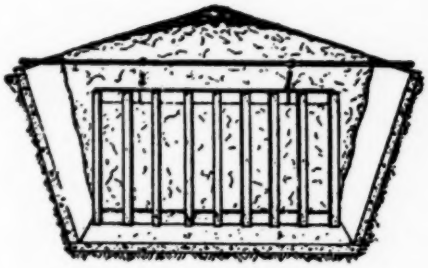
Hog production probably will increase only moderately during 1958. Spring farrowings in 1958 will be about 6 per cent larger than in 1957, according to the Crop and Livestock Reporting Service.

If the increase is no larger than 6 per cent, hog prices in the fall of 1958 probably will be down not more than $2 or $3 per hundred pounds from last fall. Since grain prices are likely to remain low, this will be a favorable price for hogs.

A large increase in hog production can be expected in 1959. In fact, both 1959 and 1960 are likely to be low price years for hogs. Prices should be favorable again by about 1961.

—Farm Outlook

Self-Fed Silage in Britain



First experiences with self-feeding were a demonstration of the cow's ability to survive in adversity. Now, after four years, sound techniques are established . . .

Condensed from
Farmer and Stock Breeder

R. Trow-Smith

SELF-FEEDING of silage by cattle began in Britain in a tentative way in 1953. With no experience, many pioneers at first found it no more than a demonstration of the ability of the cow to survive in adversity.

It is yet too early to say whether self-fed silage will become a permanent part of British live stock husbandry. But at any rate, after four years' lessons, sound techniques are established and some further bold experiments are being made.

One each of these has recently been demonstrated: first, by Warwickshire A.E.C. on self-feeding fattening bullocks in a "box-barn" silo on the farm of Mr. J. W. Russell at Durnchurch; and second, by Imperial Chemical Industries, on self-feeding on conventional lines, on the farm of Mr. R. E. L. Beddington at Hadham, Herts.

Barn-Boxed for Bullocks

At Toft Farm, Durnchurch, Mr. J. W. Russell has 354 acres of heavy land under a rotation of four years ley (grass) and three years corn (grains). Cash products are wheat, barley, beef, and sheep. No fewer than 250 to 300 bullocks (steers) are finished here every year, of which more than half are winter-fattened. Their ration is 70-80 lbs. silage, oat straw *ad lib.*, and 4-8 lbs. (according to the stage of growth) of a mixture of one part crushed oats, one part linseed cake and three parts crushed barley, to which minerals are added.

The winter work hinges around the silage clamp, and profit on beef depends largely on how much labor can be saved in the handling of this bulk feed. Mr. Russell's system cuts it down to less than 30 seconds per head a day.

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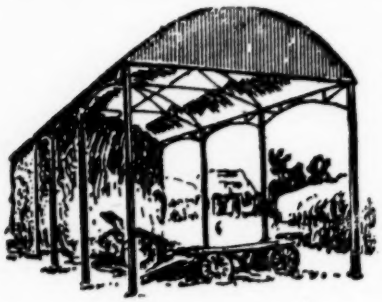
The grass from 65 acres—between 450 and 500 tons—is ensiled in one great clamp. The grass, cut between grazings, is blown into 3-4 ton trailers by a New Holland 800 forage harvester with a claimed throughput of 45 tons a day.



Typical Dutch Barn without enclosed sides.

The trailers are fitted with moving gates which push the load of cut and chopped grass into the hopper of the New Holland blower which eventually fills the silo.

The silo itself is a boxed-in Dutch barn (see illustration) of four bays, 30 ft. wide. The barn is walled up to the roof on all four sides with ex-railway timbers. These are braced with stanchions set 2 ft. 6 in. deep in concrete. An aperture is left for filling.

Blowing In

The blower can deliver the chopped grass to any position in this barn-box silo.

Molasses, diluted at a rate of one part to two of water, is added at one gallon of the dilution to one ton of green matter, through a hand lance attached to a crop sprayer.

This barn silo is filled to a consolidated depth of 11 ft. 6 in. The straw from 15 acres of barley, picked up by the New Holland, is then blown in on top of the silage and damped to weigh down the top layers of silage and prevent their overheating. No other consolidation is applied at all, apart from this layer of wet barley straw.

For feeding, one side of the barn is opened up and mangers are placed against the exposed silage face. These mangers, each 12 ft. long, are built up on a firm foundation of Bailey bridge parts, with posts and two rails above the trough to prevent stock clambering over on to the silage.

40-Minute Job

Silage is fed by one man forking it from the face into the manger in one short movement. It takes him 40 minutes to place the 70-80 lb. rations for the 108 bullocks in the mangers.

It is claimed that there is absolutely no waste of silage with this method, and that it is more economical than permitting a beast to help itself at the face to the tune of, perhaps 100 lbs. a day.

The mangers are shifted for-

ward up to the retreating face once a week, by levering them with crowbars. When they are right up against the face, stock can eat through the posts-and-rails above them to the surprising depth of 3 ft. 4 in. into the silage face.

One hundred and eight bullocks — forward Hereford - cross Irish steers of considerable weight —were feeding at the mangers along the length of the 60 ft. silage face last week. This gives them a feeding space of about 7 in. apiece.

There is 24-hour access to the mangers from the covered yards in which the stock are housed, at an average accommodation of 66 sq. ft. a bullock. Straw and concentrates are fed in other mangers alongside a central feeding passage in this yard.

This whole system is exactly duplicated at Mr. Russell's Sandpit Farm at Long Itchington, where a further 110 bullocks are manger-feeding from a 33 ft. wide five-bay box-barn silo.

To Cut the Concentrates

Mr. R. E. L. Beddington's 420-acre Albury Lodge Farm, at Little Hadham, near Bishop's Stortford, has 70 British Friesian and Dairy Shorthorn cows self-feeding silage to provide maintenance and the first two gallons of milk in winter. The rotation here is three cereal crops and a three-year ley undersown in the last, spring wheat, crop.

The ley is a timothy/meadow fescue mixture with 3 lb. cocksfoot. In addition 15-20 acres of Italian ryegrass is undersown for an early bite, and is ploughed for late May kale after two grazings. There is also a new stand of 20 acres of lucerne (alfalfa) put down each year.

About the only thing modern day youngsters will do for a dime is argue that it should have been a quarter.

The timothy/meadow fescue leys give the bulk of the silage. This is cut with a Silorator; the laceration makes quality more easily pulled out, means that a smaller feeding face per cow can be allowed.

No Additives

The 500-ton clamp of silage is made in a Dutch barn, with both ends ramped, one side sheeted in and the other long side enclosed with duckboards and chains. Nothing is added to the silage during making, which proceeds periodically through the summer.

Self-feeding started, at night only, on November 1 this year, and from November 7 24-hour access was allowed for the herd.

The duckboards along 48 ft. on one long side of the barn are removed, and the cows eat into the silage through tubular hurdles, which are fixed in sleepers

at their bases and held upright by chains attached to the stanchions on each side of the barn.

Fenced Off

The side of the other, uneaten, half of the clamp is closed off by 6 ft. chestnut fencing. The self-feeding face is 6 ft. high, which is the maximum practicable height without forking down the top layer.

A concrete apron extends along the feeding side of the barn, but the floor of the silo itself is rammed chalk and ashes.

The hurdle is moved forward every other day, and once a week the floor is cleaned up with a tractor-mounted scoop.

The 70 cows, with a 48 ft. feeding face, have 8 in. of space each. It is estimated that they consume up to 100 lbs. a head per day of this medium-quality silage (26.9 per cent dry matter, 10.4 per cent crude protein). In addition, they get a concentrate ration of two parts oats, one part barley and a balancing protein cake over the two-gallon mark. About 2 lbs. hay is also given.

Till Early Bite

It is expected that this 500-ton clamp will last the herd until stock go out to early bite on the Italian. Last year they were turned out on March 25.

On this ration, one day the 57 cows gave 180 gallons, or 94 gallons on silage alone and 86 gallons from the concentrates. The herd average for the year 1956-57 was 853 gallons for cows and 816 gallons for heifers.

This has been achieved with a saving of 43½ tons in concentrates over the pre-silage figure, with only ten acres diverted from cash cropping. The milk yield per cow has increased; and, against the 1951 results, the return from milk has risen.

With summer grass expected to provide for maintenance and up to four gallons, concentrate usage at Albury Lodge is 2.3 lbs. a gallon over the year. This is well below the 2.7 lbs. a gallon which Mr. C. S. Barnard, a Cambridge provincial economist, told visitors to the farm is a good target.

Liquid Nitrogen as Fertilizer and Weed Regulator

Liquid nitrogen may serve as both fertilizer and weed killer in corn.

The material is applied as a spray between the corn rows at lay-by time. It does an excellent job of burning weeds, as well as supplying needed nitrogen to the soil. Three years of experimental work with nitrogen in a field have been conducted by Dr. G. C. Klingman, agronomist with the North Carolina Agricultural Experiment Station. —*Florida Extension*

What to Expect from Concentrated Sterile Milk

It should have a profound effect on midwest dairying . . .

Condensed from Prairie Farmer

STERILE concentrated milk that can be substituted for fresh whole milk at a lower price may have a profound effect on the dairy industry.

Economists estimate that the cost of the new milk should be around 16 cents a quart, according to R. W. Bartlett, agricultural economist at the University of Illinois.

Concentrated milk is fresh whole milk from which most of the water has been removed. When the concentrated product is mixed with two parts of water, the mixture or reconstituted milk becomes equal to fresh pasteurized homogenized vitamin D milk with all the nutritional elements still in it.

Our dairy industry pattern will change with the concentrated milk, Bartlett said, provided: (1) consumers accept the product; (2) possible trade barriers are removed; (3) distributors' margins are low; and (4) research continues.

Taste tests and actual marketing of the product show that the consumer is beginning to accept the concentrated milk, Bartlett said. Recent taste tests at the University of Illinois conducted on 300 persons indicate that nearly half thought whole milk was concentrated milk and a third believed the milk concentrate was fresh.

A consumer panel of 100 families in Wilmington, Del., used the concentrated milk for several weeks. At the end of the period, 95.7 per cent of the persons in the panel could not tell the difference between the reconstituted milk and the conventional homogenized milk.

Concentrated milk, although relatively new, has been on grocery shelves in San Francisco since June of 1951. The sale of the product has been limited to one chain of stores which covers the city. For every quart of concentrated milk 9 quarts of whole milk were sold.

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A high quality milk is needed for consumer acceptance. One of the big drawbacks in the marketing of the product in the beginning was a cooked taste in the milk. After much research, such a taste is no longer evident.

Possible trade barriers is a second major problem in marketing the new product. As yet, there are no great difficulties, but as the markets grow, so will marketing problems.

Ventilation fans in barns should have inlets located near ceilings to mix incoming air with the warmest air in the stable before it reaches cows.

The quality of fresh whole milk has been under the control of municipal, county, and state authorities. Evaporated milk, which can be compared to concentrated milk, because both have had a great deal of water removed by cooking, has been under the control of the Pure Foods and Drug Administration.

It would appear likely that sterile milk should come under Pure Foods and Drug Administration, too. Then there are those who feel that, since it is more like fresh whole milk, it should be under whole milk laws.

Based on past history Bartlett feels that the supreme court would prohibit states and municipalities from using sanitary ordinances as trade barriers.

Trade barriers might arise when the problem of potential markets comes up. The potential market is where the consumer finds it more profitable to buy the concentrated milk than he does fresh whole milk.

Level Off Market

Let us first look at the marketing for whole milk. Fresh whole milk is bulky and perishable. Surplus milk in the spring months cannot be stored for sale during the fall deficit months.

However, concentrated milk can be transported for less and will keep longer than fresh whole milk. It is one-third as bulky and is less perishable than fresh milk. Bartlett says, it costs 3 cents to transport a quart of milk from Chicago to New Orleans. By removing two parts of water, transportation cost can be cut by 66 per cent.

Because of its sterile quality, transportation costs of concentrated milk are low and no refrigeration is needed.

Sterile milk can be kept without refrigeration for a couple of months, and with refrigeration it will keep for a longer period.

Sterile milk will find its best market, or potential market, in cities where retail whole milk is high priced. The opposite is also true. In cities where retail whole

milk is low priced, the market for sterile concentrated milk is not so good.

Geographically speaking, sterile milk will have a greater market in the South and Northeast where milk retails for around 27 cents a quart.

Market prices are from the USDA Fluid Milk and Cream Report of October, 1957.

A decline in milk production in the industrial or high-cost areas will mean an increase in the low-cost areas. The increase will be necessary to meet the demand for the additional consumption. Milk producers in the low-cost areas, such as the Midwest, are likely to produce more, Bartlett says.

Midwest dairies can produce and ship concentrated milk into the industrial areas cheaper than residents there can buy fresh whole milk. A free flow of concentrated milk would bring about a change in milk production areas.

The San Francisco market proved that a saving from concentrated milk is possible in a high-cost area. In March of 1957, whole milk sold for 22¼ cents a quart compared to 17-1/3 cents for concentrated milk. An estimate of sales showed that one quart of concentrated milk was sold for every three quarts of whole milk.

Give Way to Midwest

A southern economist says that concentrated milk would mean that the production efficiency of southern dairy herds would have to be raised to compete with the Midwest or low-cost area prices. Many dairy herds may fade out of the picture at first, but as production levels rise, the southern herds would appear again.

Seed for growing seedless watermelons can now be obtained from several seed companies. Not too expensive for home garden planting, the seed produces small high-quality fruit.

Heavy concentrated milk sales from grocery shelves in the Midwest would depend a great deal on its relationship to whole-milk prices.

There is little difference between 18 or 19 cents a quart for fresh whole milk and the 16 or 17 cents a quart of reconstituted concentrated milk would cost. However, there are other advantages.

Low distributor margins come about with quantity. The gallon container is the key to low-cost distribution of milk in many markets, Bartlett advises. Of 145 markets studied, 15 fell in the low-margin range. Of this group of 15, two out of three sold milk in gallon jugs.

In federal order markets, keen store competition will tend to lower distributors' margins. This is possible without lowering prices to producers. Ten of the 15 low-margin markets were under federal milk orders, Bartlett says.

5 to 7 Cents Cheaper

What can be expected once concentrated milk has won its place on the grocery shelf? There may be a decrease of from 5 to 7 cents a quart in the cost of milk to the consumer.

Nationally per capita milk sales may increase 15 to 20 per cent within the next 10 years. Milk production is expected to decline in the high-cost industrial areas and milk production will increase in the low-cost Midwest areas with a possible increase in price to dairymen.

Bartlett says there is wide-scale research going on to develop a high-quality sterile concentrated milk as a substitute for fresh milk. At least 20 institutions, including private firms and universities, are working on the project.

One private company has employed 15 experts to develop and market the concentrated milk. They have been working on the project for the past 3 years and expect to market the product within a short time.

100-Bushel per Acre Wheats Within 3 Years

Short wheats with tall yields—100 bushels or more to the acre—will be the next scientific "breakthrough" in wheat breeding. Dr. O. A. Vogel, one of the nation's leading wheat breeders, says high-yielding semi-dwarf wheats may be ready for release within 3 years.

Dr. Vogel, U.S.D.A. scientist stationed at Washington State College, reported that experimental plots of the shorty wheats at Pullman exceeded 100 bushels per acre with a top of 136 bushels. Omar, Brevor and Burt, he said, yielded 61 to 85 bushels per acre on similar fertile soil in Pullman.

Some strains of the short white winter common-type wheats are already being tested for milling and baking quality, Vogel said. The experimental new wheats are about 2 to 3 feet tall, or 10 to 20 inches *shorter* than Burt and Brevor, the shortest commercial winter varieties.

Most of the semi-dwarf wheats showed no lodging whatever under conditions that caused both Omar and Elmar to lodge severely, the plant breeder said. The short varieties make very dense stem growth, however, and surprisingly produced just about as much straw as the commercial varieties. —*Washington State College*

Take a Second Look at Liquid Fertilizer

Farmers are using more liquid fertilizer. It has some advantages, and the cost may be right if there is a factory near you . . .

Condensed from The Furrow

Ralph Hughes

JUST as a child learns to crawl before he can walk, farmers had to "feel" their way with liquid fertilizer. Experience gave them confidence — and added stature to this fledgling of the fertilizer industry. Liquid-mixed solutions earned new attention last year as a source of economical, easily applied plant food—so much so that in 1958 many farmers will take a second look.

The increased use of liquids came in two ways last year. First, more farmers tried liquid-mixed fertilizers than ever before. This rise in popularity was particularly noticeable in the Midwest, West, and Southwest. Second, many farmers who used starter solutions in 1956, last year swung over to mixed liquids for top-dressing before plowing and for side-dressing while cultivating.

Saving Time and Labor

These farmers reaped the real advantages of liquid fertilizer: Saving in time and labor. It just makes sense to substitute pumps and gravity for back and brawn. Turning spigots beats lifting fertilizer bags any day. Liquids speed the operation, too. Greater acreage can be covered in a day because liquid fertilizer hoppers require fewer stops for filling. This combination of less work and more speed remains the big selling point for liquids.

Crop response to mixed liquids has been the same as obtained with similar analyses of solid fertilizers. However, farmers find that with liquids they can "prescribe' exactly what fertilizer ratio their crop or soil needs. You buy exactly what you want—there's no mixing of a bag of this with two bags of that.

Compare Costs

Cost is still the single most important factor a farmer should consider when deciding which fertilizer to use. *If solids still have the edge, then that's the material to use.*

Prices, of course, vary from one area to another. If a liquid

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plant is nearby, the cost per unit of plant food within most areas is about the same for liquid fertilizers as for their dry counterparts. Remember, too, you need to figure both the cost of the material and the cost of applying it in order to get your real cost. Then, consider the time in which you have to get the job done and the labor available to do it. To paraphrase an old saying, "Labor saved is money earned."

Liquid fertilizer manufacturing plants are normally small and serve only a limited area. Usually each plant won't sell or deliver much more than 20 to 30 miles in each direction. The plant sells directly to both farmers and to well-located dealers in nearby communities who sell to farmers. However, the trend is for these dealers to set up plants of their own. So, if you don't have a plant near you now, you may have before long.

Let's take a look ahead. New plants promise to bring liquids to more areas. The plants will have a wider assortment of analyses on hand to meet local crop and soil conditions. Much new equipment is available: starter-fertilizer attachments for 2, 4-, 6-row planters; side-dressing attachments for 2- and 4-row cultivators; a distributor which holds over a ton (200 gallons) of liquid-mixed fertilizer; and attachments for grain drills—making a complete line of liquid-fertilizer equipment. Farmers who so desire can now use liquid fertilizers to meet practically all their fertility needs.

The Main Point is:

Apply the fertilizer your soil and cropping system dictates—whether you use the liquid or solid forms is a matter of personal preference.

Fertilizer in Band Cuts 'Burn' Danger

Separate banding of seed and nutrients is the best insurance against "burning" wheat with fertilizer, thinks John Guttay, soil conservationist at Michigan State University.

Most drills in use today do not permit this type of application. Until such drills are available, Guttay suggests that wheat growers can avoid fertilizer burn either by bulk spreading the entire fertilizer recommendation; bulk spreading part and drilling the rest at planting time; or drill all the fertilizer at planting time but kick up the seeding rate to offset possible injury.

Guttay added that dry weather coupled with today's more soluble fertilizers cut a wheat planting way down. Experimental data has shown that when wheat stands are reduced below 70 per cent, yields also go down. —*Agricultural News*

How to Buy and Train Your Stock Dog

Step-by-step, how to help your pup earn his room and board . . .

Condensed from The Young Farmer

Cynthia Bend

ONE of your best all-around helpers on the farm can be a well-trained dog.

But well-trained dogs are made, not born. So it's a problem of selecting a promising pup, then leading him gently through school.

After your pup wins his diploma and becomes a full-fledged farm dog, he'll show his stuff in more ways than one. Robert E. Brown, vo-ag instructor at Newark, Ill., high school, tells this story about a dog trained by young farmer, Lloyd Vogen:

"The dog will round up cows any time his master gives the order, he'll single out a pig at a time and run him into a ringing chute, he'll protect his master from sows, and he'll act as a burgler alarm whenever a stranger prowls around at night. The dog fits into Lloyd's farming program as an extra hired hand. The farm's livestock numbers are high enough so that extra help is often needed during the year. With the dog on the job, Lloyd doesn't have to face the problem of hiring outside help."

Add to these things the fact that your dog won't be concerned about pay raises, vacations, retirement benefits or a 30-hour week, and owning a well-trained farm dog seems like a good bet.

Now, just what's involved in this project of getting that new hired hand?

First of all, it's important to start out with a good pup, even if he costs a bit of money. You don't get a profitable return on your feed when you pour it down the throat of a runty pig—and you *don't get a profitable return on your dollar when you spend it on a poorly bred dog.* When you consider that on range cattle, a good dog can do the work of two men on horseback, you can see the original cost is dirt cheap. Now, let's go step by step thru the training program:

Choosing Your Pup

This is most important. Be sure the pup is from good working lines on both sides. If pos-

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sible, see the parents work cattle. Watch for the bold, fearless dog that heels low. If it is an older dog, it should be calm and steady. Avoid pups from a dog that lacks authority around livestock.

The firefly produces a cold light — something that man does not yet know how to do.

Choosing the best worker out of a six-week litter is much like trying to determine how good a football player a six-month-old youngster will turn out to be. Just pick a good sire, a good dam and a good breeder. Then choose a sound, good-looking pup with a healthy appetite and lots of pep.

And don't turn down a female without giving her a lot of consideration. She'll be around when you want her and not off on the landscape serenading a sweetheart. You can have her spayed and wind up with the virtues of both sexes.

Keeping Your Pup

More than likely, your pup will form bad habits if he runs unsupervised. Your pup is a live wire, and may take up with the neighbor's children, start chasing the chickens, or kill time by wandering out to pasture with the cattle.

Your best bet is to keep the pup in a pen, the larger the better. After he has been trained, you can let him run loose during the day, but keep him penned or tied at night.

If a dog is always kept on the chain, be sure that he gets sufficient exercise.

A pup starts to form his attitudes toward people when he is only three weeks old, so keep him with you as much as possible. If he bothers you when you are working, don't chase him away. Tie him near you. If he chases stock and poultry, it is better to tie or pen him than reprimand him too sharply. His success as a worker will depend on his love of chasing stock, and permanent harm may be done by curbing this instinct.

Although your pup will not be ready for formal training until he is six months old, it will do no harm to teach him as much simple obedience as he will absorb with a wagging tail. But train only with praise and use of the word "no." Your pup will never be a willing worker if you use force on him when he is young.

Training Principles

A dog learns, not through reason, but through memory, by repitition and association. The good or bad results of his actions should follow those actions immediately.

Work with your dog's natural instincts and desires. He wants

to please you, so the least you can do is meet him half way when he tries.

Physical manipulation by means of a leash is the easiest way to show a dog what you want. If always coupled with the same voice or hand signal, the dog will soon learn to know what you mean without use of a collar and leash. But if overdone, physical manipulation can make your dog sluggish.

Make your command a *command,* but not a bellow. Your dog's ears are better than yours. Never plead with your dog or show temper. A man who cannot control himself can never control his dog. Remember that a dog does not know the English language. Always show your dog exactly what to do as you give a command for the first time. Always give the same command for the same job. Always see that your dog obeys you. It is better to give no command than to give a command and fail to see it through.

Training will not be successful unless punishment is administered intelligently, and *never in anger.* The trainer must know two things:

(a) He must know the temperament of his dog.

(b) He must be sure that his dog knows what he is being punished for.

Never punish by frightening your dog. Avoid a wild swing of the arm or a loud crash from a newspaper. If you must spank your dog, hold him firmly with one hand and spank him with the other. Do not throw things at the dog to punish him as it makes him fear the hand motion, a severe handicap if the dog is to be taught hand signals.

A big pig crop in the spring of 1958 is expected to result in an increase in hog slaughter next fall.

Never call a dog to you, then punish him. You go to him, then give him what he has coming. If he has been handled properly, he will not run away but will stand up and take it.

After punishing, make up with a pat or a kind word, and keep the pup with you. Never let him go off and sulk, or he may become timid.

Keep training periods short and lively. If you want to get the most out of your time, never train when your dog is tired, or when you are.

Praise your dog for a job well done, but don't babble sweet nothings to him when he is working. When he hears your voice, it should mean something. A sensitive dog will need more praise than an insensitive one. Do not bribe with food.

The choke collar should not be used on pups under six months old, and on sensitive dogs, it should be used with care.

The collar is made from straight chain with a ring at each end by doubling the chain and passing it through one of the rings. Put the chain over your dog's head so that the end of the chain with the *empty* loop passes over the *top* of his neck from his *left* to *his right* side. The collar will then tighten and slack more easily when the dog is at heel beside your left knee.

Correct milking procedures cut mastitis infections in half among 468 Illinois dairy herds.

The choke collar should never be used on young pups, and the jerk should never be stronger than necessary. The dog soon learns that disobedience is followed by instant tightening of the chain about his neck, and a quick response to command becomes a reflex action. But remember to let the leash come slack after each jerk. Never try to control your dog with a tight leash.

Obedience Training

Heel, come, sit, and down may be regarded as the four corner blocks in the foundation of a dog's training. Go no farther until the corners are perfect.

Your pup should be ready for kindergarten at four or five months, but don't overdo it. Five minutes training a day is plenty.

Never get tough with a sensitive puppy. It is easy to take the spirit out of him, but impossible to put it back.

Leashbreaking — The first step in training is to get your pup used to being tied. You can either snap a leash on while walking with the pup or simply tie and leave him. The advantage to the first method is that the pup will want to follow you and will not be so apt to buck the leash and throw himself. Praise the pup when he responds to a pull and play with him a little as you walk. The average pup will not need more than five or ten minutes of this, and the job is done. If he does not want to follow, tie him first, and he will be glad to follow you when you untie the leash and lead him away.

Coming—By the time your pup is four or five months old, he has learned his name and will come quickly when called. He has learned to expect his food or a good romp when you call him to you. Now that he has learned to enjoy coming to you, put a rope on his collar and call him from his food. When he gets to you, give him a pat, then let him go right back. He will soon learn

that the quicker he comes, the quicker he can get back.

Heeling—Put a leash on your pup's collar and pull him to your left side so that his shoulders are even with your left knee. Give the command: HEEL, and step out. If he lags or forges ahead, repeat the command and pull him to you with a quick jerk. After five or ten minutes of this, he will begin to catch on. That's enough for one day. The next day he should start learning to set when you stop, but if he is not yet heeling well, wait a little longer.

Sitting—Get your dog on your left side in heel position. Push down on his hind quarter, pull his head up with the leash, and command, SIT. When he is sitting nicely, praise him, then step out with your pup at heel. When you stop, give the command, SIT. Then lean over without moving your feet and push him into position with your hands. Two days of this and he should be sitting automatically most of the time.

Staying—Your pup is now five or six months old, and he has only two more things to learn before he is ready to go to work in earnest: *sit stay* and *down stay.* You may settle for teaching only the *down* if you wish. The advantage to *sit stay* is that your dog is far enough off the ground to see what is going on; but *down stay* puts him in his natural resting position in which he can remain almost indefinitely. If you plan to teach your dog both commands, start with the *sit stay.* Put a leash on your pup's collar and give the command, *sit stay.* Move out in front of him. If he moves, repeat the command and put him back in the exact spot he left. Keep that up until you can give him the command and leave him for about one minute. This should take three or four five-minute lessons.

"Overeating disease" is most common among strong, aggressive animals.

To teach your dog *down stay,* put a leash on his collar, hold one end of it in your hand, put your foot on it near the collar, and force the dog down. Within a week he should be dropping on command and staying just as long as you want him to. Try this when there are things to distract him, then try dropping or sitting him at a short distance from you. Be ready to run out and stop him in his tracks if he doesn't obey. You can use a rope and pulley to keep him from sneaking up on you.

Your dog should be trained to *sit* and *down* in the field at some distance from you. In this train-

ing you will get better results if you use a sharp dog whistle. (Not the silent kind.) A high note will carry well, and you will have better luck with it than with a verbal command. To change a pup from verbal to whistle signals, all you have to do is give the whistle signal, then give the verbal command. After a day or two, drop the verbal command, and the job is done.

Some African elephants weigh as much as 6 tons, reach 11 feet in height.

Stock Work

There is no cut and dried way to train a stock dog. There are three variable factors: the man, the dog, and the job. If the trainer is a patient, easy-going man who is inclined to be a little soft with his dog, he should start with a young pup. If it's your desire to get results fast, train an eager, ready-to-learn dog, not a puppy.

The second variable factor is the dog. There are sharp, eager ones that need to be constantly checked and slowed down during their training. Then there are the quiet types that need to be encouraged to get in there and face up to obstinate stock. If properly handled, both kinds of dog will make good.

The third variable factor is the job. Range cattle and dairy herds are two different things, and they are not handled alike. Training for the two types of work is, in many respects, different.

It is true that some dogs are such fine natural workers that they will take to their work almost without training. If, however, you wish to get the most possible help from your dog, he will have to know definite signals and commands, and no dog will learn these without training.

Many people believe that the best way to start a pup working is to pass the job on to an older dog. *Don't do it!* The pup will not only pick up the bad habits of the older dog, but will add an impressive number of faults of his own. In addition to learning the mistakes of his elder, his initiative will not develop as it should.

This leads to the general subject of keenness, something you want to take all possible steps to foster and encourage. Keep your pup penned or chained for at least two hours before his training period, and don't rush him into cattle work before he is ready. He must be m a t u r e enough to face up to stock, probably not younger than seven months, but there is a good deal of individual variation in this. A keen young dog cannot be turned loose on cattle before he

has had obedience training. He *must* be under the control of his master.

Range Cattle

Many ranchers handle their cattle from horseback and expect their dogs to drive them as would other men.

The first step is to train the dog in obedience from horseback. If your dog is accustomed to being around horses and following you when you ride, this is not difficult. Of course, your dog should be completely under your control when you are afoot before you try your authority from the back of a horse.

The techniques for training from a horse are exactly the same as those discussed under "obedience training." For the first lesson, the dog should be on a leash not shorter than ten feet. This is long enough to enable him to keep clear of the horse's hoofs. When the dog is on leash and you want him to *sit* or *down stay,* pick a spot by a tree or fence so that you can put the end of the leash up where it's handy to grab when you return to your dog.

By the time he is a year old, your dog should be steady enough on the sit so that you can canter past him without his changing position. A word of warning is in order. *Do not keep your pup under control so rigidly that he will be reluctant to leave your side should the occasion arise.*

Best way to give dairy cows the salt they need is to add 1½ pounds of it to each 100 pounds of grain mixture when you grind the feed, says an Illinois dairy specialist.

Expose a pup to cattle when he is six to nine months old, depending on the pup. Use 10 or 15 head of gentle cattle (preferably without calves), and drive them slowly across an open pasture. Never urge the pup on when the cattle are bunched and moving. When a cow tries to quit the bunch, speak the pup's name, then point to the cow and urge him after her. If he doesn't put her back with the bunch the first time, ride around the cow and help him while another rider keeps the herd moving. If he does put her back, call him off as soon as it is evident that she is returning to the bunch and praise him. Repeat this simple process every time a cow leaves the herd. Always help him if he has trouble. Never set him on a cow and then let her escape or call him off before she rejoins the herd.

A few short drives of this nature will develop a dog that will keep the herd bunched of his own accord. He has learned that no cow is to leave the herd,

and he will see to it that none does. He has learned that he is never to bark at or bother the herd as a whole as long as it is moving away from the rider — only when it scatters or stragglers begin to drop out. One reason that this plan works so well is that it takes less nerve for a pup to attack one cow than it does for him to attack a group of cattle. He will, therefore, take naturally to heeling strays.

Texas has 331,567 farms, with an average area of 438 acres.

Once your cattle are accustomed to being handled by a dog, you will find that the mere presence of the dog is enough to keep them bunched. The cattle soon learn that they must stay together or suffer the consequences.

Dairy Cattle

The chief function of a dairy man's dog is to pen the cows, preferably alone. It takes more training to get a dog to do this than it does to get him to do the basic driving which is all that is required by most ranchers. The training methods which follow can be used on range as well as farm dogs, so, if you want more than a basic driver, read and apply them.

Driving — The stock selected for the pup's first exercise in driving should be gentle and free-moving. Since the pup should be kept behind the cattle, a barn where the stock cannot spread out is a good place in which to start.

At milking time, tie the dog in the barn near the door and command, *down stay.* When a cow is ready to be released, untie the dog and command, *drive.* Urge the dog to heel the cow and drive her out the door. Use your leash to restrain the dog from following the cow out of the barn.

A well-bred dog will usually heel the cow the first time, but if he doesn't, don't condemn him too quickly. You might try throwing pebbles at the heels of the cow or getting the pup to play with a gunny sack. When he starts snapping at it, wave it behind the cow at her hoofs and hope that the dog will get the cow as well as the sack.

Some pups do not work well under too much restraint. If your dog is of that type, he may start better in a line than in a barn. It should be narrow so that the stock cannot spread out.

In the larger area of the pasture, you may run into situations in which a longer reach is handy. A B-B gun will supply it very nicely. When a cow decides to turn on a pup, you are in a position to change her mind in a hurry.

Until you wish to use him, your dog should be walking at heel. To send him out, speak his name and give him an underhand signal (do not command *drive* unless you want him to heel the cow.) If he does not start, repeat the command and throw out a handful of pebbles or tickle the cow with a B-B. Besides giving the pup something tangible to chase, the pebbles or B-B will move the cows and so arouse the pup's interest. He will think he started the cattle and he'll be keen to go after them.

He should follow along behind without rushing the herd as a whole. Encourage him to nip the heels of laggers, but *do not let him heel animals that are standing still as they are in a position to kick hard. Rather,* go to the aid of the pup and get the animal moving. Care should be taken to keep the pup from becoming frightened in the early stages. If an animal shows a desire to chase him, step in and move it. Do *not* allow the pup to stand and bark. Sooner or later, in spite of your precautions, your pup may get kicked. When that time comes, do not allow him to quit. Keep him with cattle until he overcomes his fear.

When your dog's love of working is well developed, it is time to start using obedience commands in the field. A good dog will probably try to do too much at first and will need to be checked. This is best done by putting him on a thirty foot line. If he drives too fast, *sit* or *drop* him. You will probably need to use the line the first time. (Do not try to sit him one time and drop him the next. Be consistent.) He should go down instantly and stay there until you call his name and signal him on. Use the command *slow* in a dragged out tone. If he goes too fast, repeat the performance. If he seems to need it, put him back on straight obedience for a few days.

In a laying flock with a production per bird of 16 dozen eggs annually, each one cent change in the selling price or production cost per dozen changes the yearly income by $160 for each 1,000 layers.

Do not let your pup get the habit of chasing. Some trainers will urge on a timid pup to the point where he becomes an excessive barker, develops a heading tendency, or becomes a chaser. If the pup is timid, postpone further cattle work for a month or two. If one leaves him alone, he will likely lose his timidity.

When your dog knows what is expected of him, keeps behind the cows, and drives well along a lane, it is time to let him handle

cattle in a big field. Here he will have to learn one new thing: how to turn a single cow. Point out the animal to him, go to it yourself, and call him to you. If you have a good dog, he will soon catch on to turning a stray even without your signal.

Penning and Holding — As soon as your dog develops a fair amount of proficiency at driving, it is time for simple penning such as putting cattle in a corral or barn. Little need be said here except that you should be sure to make the dog drop at the gate or door; also take care that a cow doesn't get him while he is down.

Holding stock in the corner of a corral or pasture is taught in the same way except that the pup must be encouraged to break from the down position to prevent an animal from passing him. This should never be taught to a pup or to any dog that has a tendency to break. Since you do not want your dog to get in the habit of breaking when you command *stay,* use the command *hold* when you want him to break in order to drive a bunch-quitter back to the herd.

It will take further training before your dog will circle a herd and drive it toward you, but it's one of the things that can be done. Other post-graduate work might include teaching him to round up a herd that's out of sight or training him to load cattle aboard a truck.

A cattle dog will readily switch over to herding hogs, too. Usually he'll be more useful in handling single pigs than a bunch. You know how tough it is to keep hogs together as a group!

You'll get a great deal of pleasure out of finishing the training job. Having your dog obey a command to round up the herd or bring in a stray cow can provide one of life's genuine satisfactions.

Feed Wet Corn to Livestock

Best way to get full value out of wet corn is to feed it to livestock.

Don Walker, Illinois livestock specialist, says that soft corn stored in cribs is equal in feeding value to mature corn for beef cattle and hogs.

However, daily gains on wet corn are usually less because its greater bulk fills the animals before they have eaten as much total feed on a dry matter basis. To prevent excess spoilage, wet corn stored in conventional or temporary cribs or piled on the ground must be fed before spring. —*Farm News*

Sorghum Makes Good Feed

Here's what two Nebraska feeders say about sorghum for hogs and beef cattle.

Condensed from Nebraska Farmer

Dick Coffey

FOR THE past 4 years, Dan O'Connell of Holdrege, Nebraska, has been raising and feeding grain sorghum to hogs. O'Connell says that if he could buy corn for the same price he would still feed sorghum.

Carl D. Hanson, a cattle feeder northwest of Holdrege, likes to feed half sorghum and half corn. He says it is an easy grain to feed and believes more people would use sorghum if they had facilities for preparing it.

Hanson, who occasionally feeds hogs, feels that sorghum is equal to corn as a grain for hogs since they don't require as high a finish.

These are two feeders' comments in response to Nebraska's record-breaking grain sorghum crop. The State-Federal Division of Agricultural Statistics Oct. 1 forecast indicated a crop of 76,824,000 bushels of grain sorghum, more than 20 times as much as the 10-year average and six times as much as last year. Much of this important crop will be utilized in Nebraska feedlots.

Following are the experiences of O'Connell and Hanson in feeding grain sorghum.

O'Connell, who feeds 200-600 hogs a year, is convinced that hogs will finish faster on sorghum than on corn. He says hogs seem to like it better than corn.

Also, sorghum works into his program well because of government corn allotments. He can sell his corn as a cash crop and feed his sorghum.

He has self-fed sorghum whole and cracked and is now feeding it hammer-milled with protein and molasses mixed in. He said sorghum fed whole seemed to go through the hogs; and he changed from cracked to hammer-mill because he could get it custom mixed right on the farm with molasses and protein. He ex-

Reprinted by permission from Nebraska Farmer, Lincoln, Nebraska

plained that he couldn't afford to feed protein free choice like he had been doing with cracked sorghum.

Not only is it cheaper to mix the protein, but the hogs are sure of getting the right amount, O'Connell said. He is able to cut down on protein as the pigs get older, too.

A baby girl born in the U. S. today can expect to live 72 years; a boy, 66 years. Fifty years ago, it was 48 and 46, respectively.

O'Connell feels cracked or rolled sorghum is more desirable than hammer-milled if molasses is not mixed in. He explains the hammer-milled sorghum is too powdery without molasses.

A commercial feed is used until the pigs weigh about 40 pounds, then they are put on sorghum.

O'Connell figures his cost per 100 pounds of gain from 40 pounds up to market weight at $8.75. This figure is based on a sorghum price of $1.10 a hundred pounds. Hogs are marketed at 200-225 pounds.

Amount of molasses varies, the average being 150 pounds of molasses to 3,000 pounds of sorghum and alfalfa.

O'Connell finds that he must add alfalfa to his ration to get enough vitamin A. He uses alfalfa bales, pellets or meals.

For hogs weighing 100 pounds or more, he uses 10 to 12% pelleted protein supplement. Before hogs reach 100 pounds, he feeds 18% protein.

He has used up his grain sorghum supply several times and has switched to corn. He reports that consumption is lower and that the regular gain is slower when changing over.

Sows get grain sorghum, too. During gestation the sow ration is about 600 pounds of alfalfa, 300 pounds of brood sow supplement and 1,200 pounds of sorghum; after gestation, about 1,700 pounds of sorghum, 300 pounds of brood sow supplement and alfalfa free choice.

Molasses content is about 100 pounds to 3,000 pounds of sorghum and alfalfa. Brood sows get baled alfalfa because of the bulk.

O'Connell uses 8% pelleted protein per 100 pounds of brood sow supplement. However, he added, they pick up about 5% protein in the alfalfa.

Added support for O'Connell's methods might be the fact that the top market hog at the Phelps county fair was shown by Mr.

and Mrs. O'Connell's daughter, Karen. The porker was sorghum fed. Their son, Danny, had a blue ribbon market hog at the fair that was also sorghum-fed.

Sorghum for Cattle

Carl Hanson, who feeds 2,000-3,000 cattle a year, uses a ration of half sorghum-half corn. He feels corn adds a better finish than sorghum alone, but he always uses at least half sorghum if the price ratio is right. He likes to have the price of sorghum about 90% of the price of corn because some extra expense is necessary for equipment to roll and feed it right.

Hanson believes more people would use sorghum if they had facilities for mixing it. He has a mill with corrugated rolls that are adapted to roll sorghum on half of the roll and corn on the other half. He aims to crack the grain just slightly.

The rolls can be adjusted so any amount of either grain can be used. By the time the grains reach the bins they are well mixed.

On a ration of corn and sorghum grain, chopped hay, alfalfa pellets, pelleted protein, and usually some silage, Hanson figures his cost per pound of gain at 15-16 cents at October 1 grain prices.

He figures 5 to 8 pounds gain per bushel (standard weight of sorghum per bushel is 56 pounds) of grain depending upon the amount of roughage and the size of the cattle.

Most people do what is required of them. Successful people do more.

His starting ration includes 8 pounds of corn-sorghum grain, which is increased ½ pound per day up to 15-16 pounds. During the next 10 days, grain is increased to "as much as the cattle will eat," which varies from 16-24 pounds depending on the size of the cattle. Hanson said it takes about 30 days to get the cattle on full feed.

During green-chop season, Hanson feeds green-chopped alfalfa with molasses as roughage. When the green crop season is over, he feeds corn or sorghum silage.

Grain, protein and alfalfa pellets are weighed, and approximately 3-6 pounds of roughage are included in the ration. He uses a 25% pelleted protein with 10 milligrams of stilbestrol.

Hanson concluded that sorghum is an easy grain to feed. He believes cattle will take to it a little better than corn. When necessary he has changed from one grain to the other without upsetting the cattle.

Dairymen: Take This Management Test

Condensed from COBA News

H. Joe Bearden, Cornell University

LISTED below in question form are 10 management practices which help maintain a high breeding efficiency. To see where you stand in your breeding program place a check mark in the appropriate box after each question.

1. Do you keep accurate breeding records: All heat dates, service dates and calving dates? yes ☐ no ☐
2. Do you wait at least 60 days following calving to breed your cows? yes ☐ no ☐
3. Do you turn your cows out at least once each day for exercise and heat checking? yes ☐ no ☐
4. Do you know the complete breeding history of your cows; their past performance and difficulties? yes ☐ no ☐
5. Do you have your cows checked for pregnancy between 60 and 90 days after breeding? yes ☐ no ☐
6. Do you have cows with abnormal discharges examined and treated by your veterinarian? yes ☐ no ☐
7. Do you wait six hours after the beginning of heat to have your cows bred but try to get the job done within four hours after the end of heat? yes ☐ no ☐
8. Do you call your veterinarian in to examine cows which have not settled by three services? yes ☐ no ☐
9. Do you feed your heifers sufficient amounts of good quality hay and grain to keep them growing normally and coming into heat regularly? yes ☐ no ☐
10. Do your cows have free access to a good mineral mixture: one part dicalcium

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phosphate to one part trace mineralized salt? yes ☐ no ☐

If you have answered no to more than three of these questions, you probably are not doing as much as you could to maintain a high breeding efficiency.

These ten practices are not all that one needs to do but are the ones normally considered most important.

Wet Corn Value

What should I do with my wet corn? Should I buy more hogs and feed it before it spoils? Can I afford to sell it, or can I afford a dryer? These are some of the questions that farmers are asking.

Noah Hadley, Purdue University farm economist, says the wet corn is worth more as feed than it is on the market. Using only the moisture content of corn, the following table will help in figuring the value of wet corn.

per cent of moisture	approx. mkt value shelled corn	feed value shelled corn	feed value ear corn
15.5%	$1.00	$1.00	$1.00
17.0	.95½	.98	.97
18.0	.85	.97	.96
20.0	.92½	.95	.92
22.0	.80½	.92	.89
24.0	.74½	.90	.86
26.0	.68½	.88	.83
28.0	.62½	.85	.80
30.0	.56½	.83	.77

For example, if a bushel of No. 2 corn is worth $1.00 on the market, it is also worth $1.00 as feed. While a bushel of 24 per cent moisture corn is worth 90 cents as feed on this basis, it will bring only 74½ cents on the market. Using the same 24 per cent corn, you can afford to spend 15½ cents per bushel for drying and keep the corn. Therefore, if you have 3,000 bushels of corn to dry, you can afford to spend $450 on drying equipment and still break even.

W. S. Farris, Purdue agricultural economist, says the cash grain farmer can hardly afford to sell his corn without drying it, and the livestock farmer can hardly afford to sell it at 74½ cents when it is worth 90 cents a bushel as feed. —*Purdue University*

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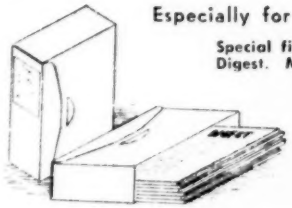

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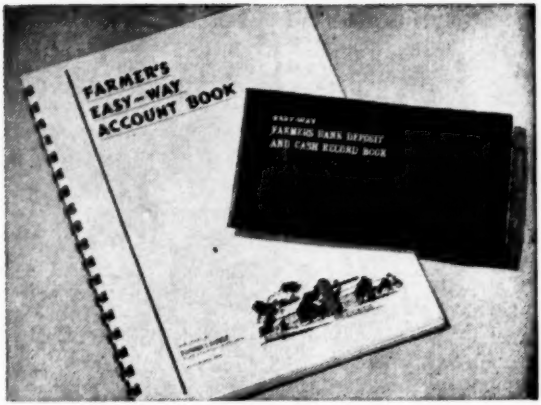

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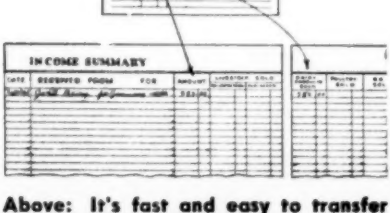

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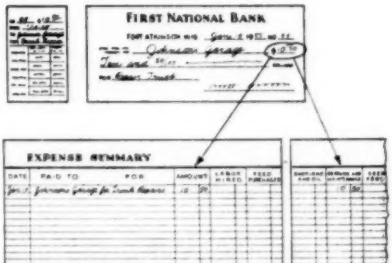

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